AVIATION

The Oldest American Aeronautical Magazine

SEPTEMBER 5, 1927 Issued Weekly PRICE 15 CENTS

Fokker Universal of Reynolds Airways, Inc., pacing speed boats off Greenwich, Conn.

VOLUME XXIII

NUMBER 10

SPECIAL FEATURES

WINNING BALLOON RACES WITH RADIO AID
STOCK CONTROL IN AIRCRAFT MANUFACTURING
QUANTITY PRODUCTION OF FAIRCHILD PONTOONS

AVIATION PUBLISHING CORPORATION

Editorial and Business Offices
250 WEST 57 STREET, NEW YORK

Publication Office
HIGHLAND, N. Y.

Entered as Second-Class Matter, Nov. 22, 1920, at the Post Office, at Highland, N. Y. under Act of March 3, 1879

The Pitcairn Mailwing

PITCAIRN MAILWING (Wright Whirlwind Engine)

HIGH performance, maneuverability, ease of maintenance and low cost of operation are the features incorporated in the design and construction of the Pitcairn Mailwing—a plane produced especially for economical contract air mail operation

The fuselage is constructed along the well-known Pitcairn practice of welded steel tubing of square section

The wing section employed is a special development of our Engineering Division, giving wide speed range with a high load factor

Equipped with the Wright Whirlwind J-5-C air-cooled engine of 200 horse-power, the Mailwing is characterized by its high performance and wide speed range and its remarkable maneuverability

Overall span	33 ft
Overall length	22 ft $10\frac{1}{2}$ in
Wing area	252 sq ft
Weight empty, including batteries landing lights parachute flares etc	1742 lbs
Total weight	2513 lbs
Pay load	800-600 lbs
Maximum speed	136 miles per hour
Minimum speed	45 miles per hour

We welcome your inspection of the Mailwing and our other aircraft either at the factory at Bryn Athyn, Pa., or at the flying field

PITCAIRN AIRCRAFT INC

LAND TITLE BUILDING PHILADELPHIA

THE EYES OF THE WORLD are centered upon aviation today. Never since the Wrights made their first historic flight at Kitty Hawk has there been so much public interest in airplanes and flying achievements.

This renewed public attention is giving a great impetus to commercial aviation. It is safe to predict that greater progress will be made in the development of commercial air transportation during the coming year than at any time during the whole history of aviation.

The success of commercial aviation depends upon the degree of safety which it attains. There is no longer any question about the safety of the airplane itself as a means of transportation. It is quite generally recognized that a well constructed airplane is as safe as a first class passenger train, providing both plane and motor are kept in perfect condition.

The development of commercial aviation on a larger scale is chiefly, then, a question of maintenance. The planes must be rigidly inspected before they are allowed to take off. The motor must be kept in perfect running condition, as engine failure inevitably means a forced landing and a possible crash. Above all, the motor must be correctly lubricated.

Stanolind Aero Oil

is the ideal lubricant for airplane motors. A record of 3,723,000 miles in the U. S. Air Mail planes, without a single instance of engine failure traceable to faulty lubrication, has proved its quality.

Stanolind Aero Oil may be obtained at practically all landing fields throughout the Middle West.

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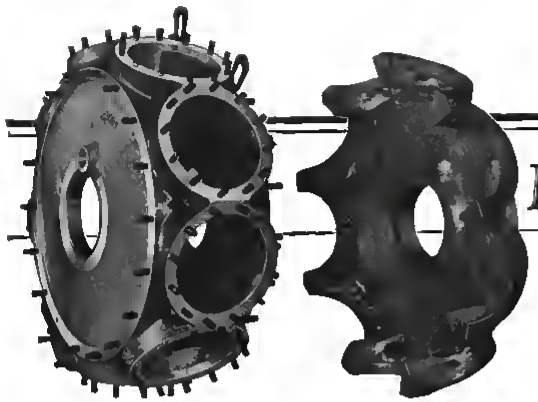


Wasp & Hornet

Leadership

One piece Master Connecting Rod and Built-up Crankshaft

Divided and Forged Aluminum Main Crankcase

Grouping of all accessories at the rear of the engine

Complete enclosure of all working parts

Forged and Divided Aluminum Main Crankcase

The Wasp
425 H.P.
at 1900 R.P.M.
Weight 650 lbs.

The Hornet
525 H.P.
at 1900 R.P.M.
Weight 750 lbs.

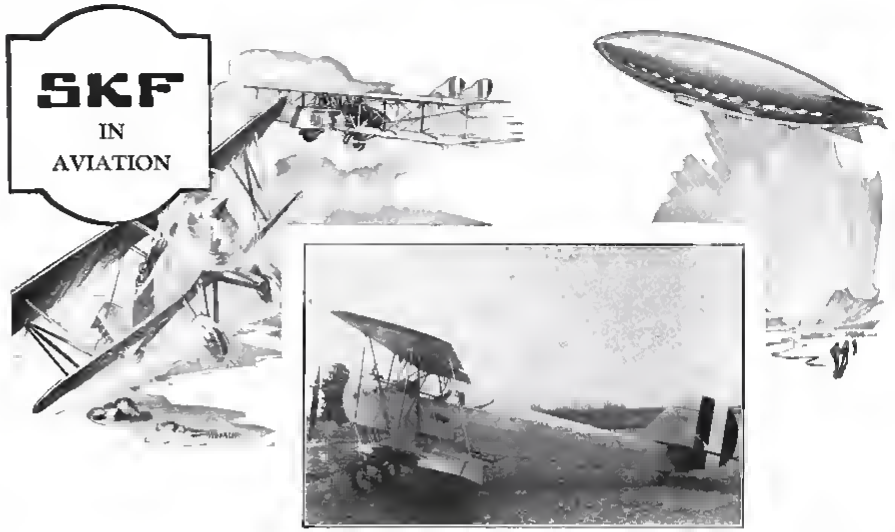
Pratt & Whitney engines feature a forged instead of cast aluminum main crankcase, consisting of two identical pieces facing each other and held together by nine through bolts, one between each two cylinders.

The forging increases the strength two-fold and eliminates the danger of casting defects. The design divides the load equally between the two main bearings and provides rigid crankshaft support.

This basic feature in both the "Wasp" and the "Hornet" has paved the way for high powered, big displacement air-cooled radials and is making possible the broad application of this type of engine.

THE
PRATT & WHITNEY AIRCRAFT CO.
HARTFORD CONNECTICUT

DEPENDABLE ENGINES



Ailerons of Dual-Control Plane Equipped with 35 SKF Bearings

SEVENTY of these Consolidated Aircraft, dual-control, planes are being built to train Uncle Sam's flyers. Not only are the important bearing locations of the motors equipped with SKF Bearings but, in addition, 35 SKF Bearings will be used on the control stick, ailerons and other important control points of each plane.

Dependability and SKF Bearings have become synonymous in aviation. This has been proved on every epoch-making flight in the past decade. SKF Bearings have been with Lindbergh, Chamberlin and Byrd on their trans-Atlantic hops, with Byrd to the North Pole, on the NC-4, with Lt. Maughan on the famous dawn-to-dusk flight and are now on the Los Angeles.

SKF INDUSTRIES, INC., 40 East 34th Street, New York City

1885

Ball Bearings

Roller Bearings

AVIATION

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AVIATION PUBLISHING CORP
Business and Editorial Offices:—250 W 57TH ST., NEW YORK
Cable Address:—AEROENG
Publication Office:—HIGHLAND, N. Y.
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NEWS ARTICLES AND ITEMS

FEATURES AND DEPARTMENTS

Subscription price: Four dollars per year Canada five dollars Foreign six dollars. Single current copies fifteen cents. Back numbers, 25 cents. Advertising rates on application.

Issued every Monday. Forms close ten days previously. Entered as second-class matter Nov 22, 1926, at the Post Office at Highland, N. Y., under act of March 3, 1879.

With the Editor

The matter of stock control in the manufacturing of aircraft is of no mean importance if every effort is to be extended in keeping costs at a minimum. Various systems of maintaining an accurate record of the inflow of raw materials and the outgo of the finished product have been devised, some of which have served their purposes to a fair degree, while others have proved useless as well as costly.

On page 531 of this issue of AVIATION is an article by Willis Parker which describes in detail the perpetual inventory plan now being employed by the Alexander Aircraft Co., of Denver, Col. Briefly, it is confined to a loose leaf binder, and data about each and every one of the 1,400 parts carried in stock is entered on a separate set of two cards filed face to face. By merely referring to these sets of cards one may ascertain the entire history of any particular part used in the manufacture of the plane.

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Number of Airplane Manufacturers

HOW MANY airplane manufacturers there will be is a question almost as important as is the number of airplanes which will be produced. The capitalist investing in an airplane factory must judge not only the potential demand for his particular product but also whether his product can be manufactured more cheaply and better by a larger organization. The history of automobile building has shown a constant tendency towards a lessening of the number of firms manufacturing and an increase in the production of the survivors, but there are several indications that airplane manufacture will not follow the same course.

In the first place airplanes are simpler than automobiles to build and there is little likelihood that in the near future they will require the tremendous investments in machinery which are required in the building of automobiles or engines. If this continues to be true the small manufacturer will be able to afford good production machinery and his chief handicap will be in the purchase of material.

The most important difference though between the automobile and the airplane market is the fact that with automobiles a change in the body type is enough to change the purpose of the automobile whereas in the airplane the whole structure must be changed to suit special conditions. In other words within a given price range all automobiles are pretty much alike in performance and size while with airplanes the range of performance varies greatly within the same price range. Thus one airplane may be designed to take off quickly out of small fields and to climb quickly while another plane of different design but of the same horsepower and price may require a long run and have a slow climb but would be extremely useful on a freight route over level country. A study of the various mail lines reveals that very different types of planes are needed in different parts of the country and that standardization of types of planes of the same horsepower is not probable. The airplane situation is comparable to the marine situation where a two hundred horsepower engine may drive a speed boat at 40 m.p.h. or a freighter at 7 m.p.h.

In general it is conceded that concentration on one particular line of endeavor leads to perfection and better results than the same amount of effort scattered in various directions. This would lead to the belief that there would be many airplane manufacturers each specializing in a particular type of plane. In the long run a group of firms might unite into one organization but for years to come it is probable that there will be economic justification for a number of small manufacturers.

Improved Aerial Machine Guns

ALTHOUGH GREAT progress in the design of military aircraft and their power plants has been made since the signing of the Armistice there seems to have been very little attention paid to improvement of the aerial machine gun. From the experience gained in the World War designers have concentrated not only on performance and capacity of war planes, but have also striven to lessen the amount of blind area, particularly on bombing planes. And in the cases of the new Curtiss "Condor" and the Keystone "Super Cyclops" an exceedingly high degree of success has been attained.

However, the fact that all angles of attack can be covered matters not if the machine gun jams at a critical moment. Pursuit or observation planes of present day types have a fair chance to maneuver out of the line of fire, but a bomber with jammed guns is helpless. From the standpoint of aerial warfare a bomber has always been, and probably always will be, a defensive plane. And for that reason great care should be taken that its guns will always respond to trigger action. One way to accomplish this might be for Army Air Corps gunnery experts to conduct an intensive research into the causes of stoppages and jams and seek to eliminate them by experimenting in new designs of the faulty part.

Distinctive Markings

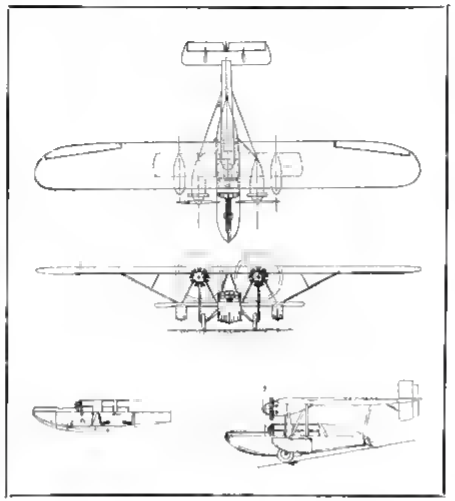
THE DIFFICULTY that has been experienced by observers of passing long distance planes in establishing their identity, seems to indicate that some sort of system of marking the planes should be devised so that there will be no chance for mistake. During some of the recent long distance ventures reports were received from land radio stations and ships at sea of the passing of a plane over head in broad daylight, but due to poor visibility its markings were not distinguished.

Trans-Atlantic and trans-Pacific flying is yet in the experimental stage, and every effort should be made to obtain an accurate record of the progress of a plane traversing either of these bodies of water without the aid of radio. The style of markings is a matter for considerable thought. But perhaps something such as a broad band of white encircling a dark colored fuselage, or vice-versa, or a distinguishable contrast in the color of the wings, and at night a particular combination of running lights, visible from below, might go far towards enabling the observer to establish the true identity of the passing plane.

The New Sikorsky Flying Boat

S-36 is an Eight Seater Boat Powered With Two Wright Whirlwind J5C Engines and is Designed to be Fitted With a Land Chassis

IN COMMERCIAL aeronautics there are almost unlimited possibilities for a flying boat fitted with a retractable landing gear enabling it to land on the ground as well as on the water. With this in mind the Sikorsky Manufacturing Co., of New York City, has produced an eight seater flying boat, model S-36 1927, designed to be fitted with a landing chassis. The S 36, powered with two Wright Whirlwind J5C engines, is a sesquiplane with the hull at the lower wing. The engines are located slightly below and in front of the upper wing. The hull is of hard wood, covered with duralumin sheeting, while the wings and tail structure are entirely of metal covered with fabric. The tail surfaces are supported by a metal outrigged structure attached at the center of the upper wing and reinforced by two members from the stern of the hull. The wing and tail trusses are very simple, with external wire bracing replaced by streamline steel struts wherever possible. This arrangement reduces vibration to a minimum and at the same time facilitates assembly. The standard service type, model S 36, weighs 3,950 lb. empty and with a useful load of 2,000 lb. has a high speed of 120 m.p.h. and a landing speed of 49 m.p.h. In recent tests it maintained an altitude of 1,500 ft. on one engine with a useful load of 2,500 lb. and at the same time was entirely maneuverable.



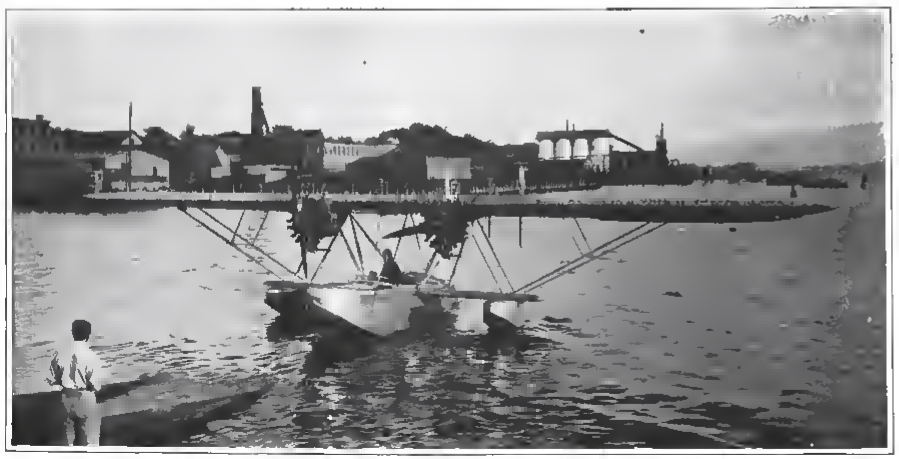
Three view drawing and cross section of hull of the Sikorsky S-36.

S-36 Built in Three Models

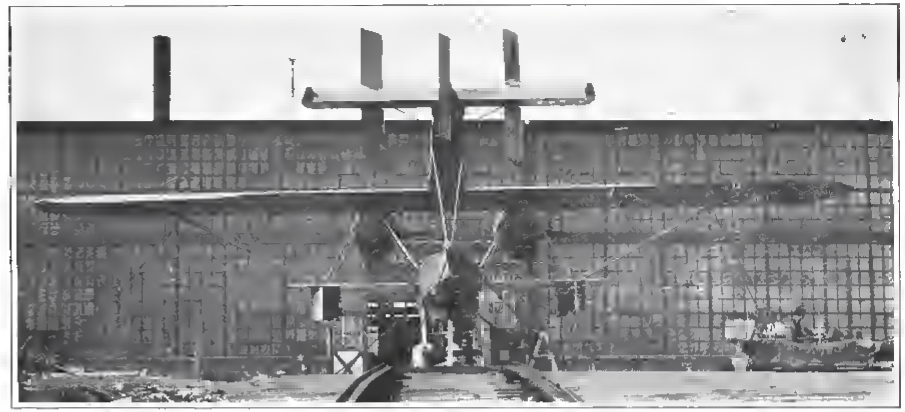
The S-36 is built in three models,—the first two seating eight persons, one pilot and seven passengers. Of these two planes one is fitted with a closed cabin while the other has open cockpits. The third model has a cockpit in front with two seats arranged side by side and a cargo compartment of 175 cu. ft. in the rear. All three models can be furnished in two different types namely, the service and the long distance type. The long distance type has a larger wing area and differs in the installation of tanks and special equipment.

The first S-36 model, an open cockpit flying boat of the service type, is now complete. The others which are to be amphibians are under construction. This first plane was built for the Andean National Corp., Ltd. to operate up the Magdalena River in the Republic of Columbia.

The hull when fitted with a closed cabin is 26 ft. long, 4 ft. 3 in. wide and 5 ft. 2 in. high. It has a 12 deg. Vee at the bottom with a step slightly to the rear of the mid point.



The new Sikorsky flying boat S 36 powered with two J5C Wright Whirlwind engines.



Rear view of the Sikorsky S-36, an eight seater twin engine flying boat.

It is built of varnished duralumin sheets screwed to a hardwood frame. For this purpose, duralumin wood screws are used, while at the chine, and wherever the covering is reinforced, duralumin rivets are used. Steel tubular members across the hull are bolted in place. Gusset plates are of duralumin, protected from corrosion by a special primer giving them a rich brown color. The wood structure is finished with a coat of varnish.

Frames making up the internal hull structure are of both solid wood and built up wood sections, reinforced with sheet duralumin, depending upon the stress at that point. The flying boats were designed in accordance with the U. S. Air Corps and the Department of Commerce stress analysis requirements.

The hull is divided into numerous water tight compartments by sheets of duralumin. These duralumin partitions are so arranged that by removing a few bolts one can easily crawl inside the hull to inspect or repair the structure. The bow of the hull is provided with an opening through which the pilot can drop anchor or effect a mooring when the boat is afloat.

Dual Side by Side Control

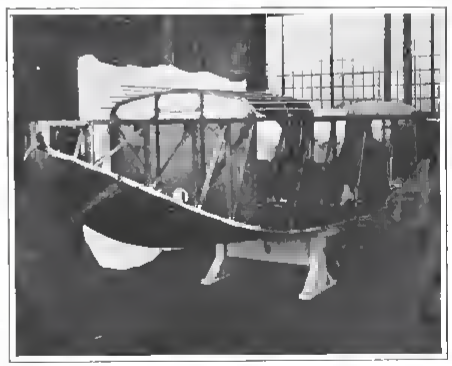
The cockpit, with dual side by side control, is in the front part of the cabin just forward and below the leading edge of the upper wing, giving excellent visibility in all directions. Behind the cockpit are two seats, each comfortably accommodating three passengers. In the stern of the hull, behind the cockpits is a compartment for luggage. On the open type, windshields are provided for each cockpit. The closed cabin plane is equipped with an efficient ventilation system and is electrically lighted.

The wings, employing a Sikorsky airfoil, are of original yet simple design. The internal structure is of riveted and bolted duralumin; no welding is used in the entire wing. This structure, which is remarkably light in weight, lends itself readily to the fabrication of most of the members on a production basis, reducing the cost and increasing the rate of production.

The spars consist of two main members of T-section, one above the other, the lower one being inverted with the stem of the T upwards. These T-section members are a development of Sikorsky's, having the small bulbs at the ends of the flanges (the head of the T) being placed on the inside (toward the stem). By having these small bulbs tangent to the ends of the T-head on the side towards the stem a small flange results on that side increasing the moment of inertia about the vertical axis and still leaving the top and bottom surfaces of the spar flanges flat and unobstructed for riveting or reinforcing plates. The stems of the upper and lower T section members are joined by diagonal members riveted in place by a single rivet at each end, making the spar into a Warren truss. All rivets are duralumin while bolts of chrome nickel are used on the major assemblies.

Drag bracing is of the conventional type with the rods bolted to the spars as are the compression ribs also. These compression members are of the same type of construction as the spars except that the flanges of the longitudinal or compression members are perforated thus reducing the weight. Channel diagonal braces give the compression members a normal Warren truss.

The ribs are of such design that they can be produced on a production basis. The cap strips and diagonal bracing members are of duralumin channels riveted together and giving a conventional type rib truss. The flanges of the channels used for the diagonal members are flattened at the ends to facilitate riveting. A simple duralumin fitting, interchangeable at all points is used where the diagonal bracing meets the cap strips. The two rivets hold this fitting to the cap strip, while another rivet is used to fasten two diagonal braces to each fitting.



Hull of the S-36 under construction at the Sikorsky factory, College Point, L. I.

In the wing structure the spars, drag bracing and all parts that do not come in direct contact with fabric covering are finished with a coat of varnish. All parts that come in con-

tact with the fabric, and consequently the dope, are protected by a primer.

The tail structure is supported high above the ground or water by an outrigged member. It is built up like a fuselage of four longerons and the necessary cross bracing. The members are of duralumin and of the usual Sikorsky type construction. Two single steel tubes from the stern of the hull support the outrigger at a point about two thirds from its forward end. The outrigger is attached at the mid-point of the upper wing where two diagonal struts support it from the sides of the hull.

The control surfaces are entirely of metal covered with fabric. Both elevators and ailerons are of the mitered type, controlled by cables from the cockpit, vertically upwards to the wing and then below the outrigger to the tail, or through the wing to the aileron control. The ailerons are each controlled by a yoke with a cable at each end. By a few minor adjustments a differential aileron motion can be easily obtained.

Rudders Patented by Mr. Sikorsky

The rudders, of the compensating type, are quite unconventional, being covered in U. S. patent No. 1560869 by Igor I. Sikorsky. This method of cambering the rudders on the Sikorsky two engined planes contributes to the outstanding ease of control in flight on one engine. With one engine stopped, the camber of each airfoil, one in the slipstream and one out of it, tends to counteract the off-set thrust of the engine running, giving complete control of the plane.

In the service type the fuel supply is carried in the leading edge of the center section, while on the long distance types there are additional tanks behind each engine and in the nose of the hull.

The following figures on the S-28-1927 were submitted by the manufacturers:

SERVICE TYPE	
Span of upper wing	82 ft.
Span of lower wing	16 ft. 1 in.
Length overall	34 ft.
Height on wheels	12 ft.
Area of plane	585 sq. ft.
Weight empty	3,950 lb.
Useful load	2,000 lb.
Water displacement of boat	17,670 lb.
of wing tip floats	2,800 lb.
Power Plant	
Two Wright Whirlwind J-5 aircooled engines (other aircooled or water cooled engines of similar power can be used).	
Load per sq. ft.	10.25 lb.
Load per hp.	13 lb.
Load factors:	
High incidence	5.2
Low incidence	3.6
Inverted flight	2.0
Nose dive	2.0
Distribution of load	
(a) As a passenger carrier	
One pilot and 7 passengers	1,360 lb.
Gas and oil for 4 hr.	600 lb.
Baggage and extras	40 lb.
Total normal useful load	2,000 lb.
Weight empty	3,950 lb.
Extra	50 lb.
Gross weight	6,000 lb.
(b) As an express or mail carrier	
Two men of crew	350 lb.
Gas and oil for 4 hr.	600 lb.
Payload	1,000 lb.
Extra	50 lb.
Total useful load	2,000 lb.
(c) The available cubic capacity for cargo or mail is as follows:	
Passenger compartment	126 sq. ft.
Compartment in front of boat	24 sq. ft.
Compartment in rear of boat	25 sq. ft.
(Pilot's compartment—75 sq. ft.)	

With normal useful load of 2,000 lb. the plane will fly without losing altitude on one ont of the two engines.

Performance with normal useful load:	
High speed on two engines	120 m.p.h.
Cruising speed	100 m.p.h.
Stalling speed	49 m.p.h.
Speed on one engine	85 m.p.h.
Climb at ground also on two engines	600 ft.p.m.
Ceiling	15,000 ft.
Gliding angle	one to ten
LONG DISTANCE TYPE	
Span of upper wing	72 ft.
Span of lower wing	24 ft.
Length overall	34 ft.
Height on wheels	12 ft.
Area of plane	668 sq. ft.
Weight empty	4,400 lb.
Disposable load	3,000 lb.
Total water displacement of boat	17,670 lb.
Power Plant:	
Two Wright J-5 engines	
Wing tip floats	2,800 lb.
Load per hp.	16.1 lb.
Load per sq. ft.	11.1
Load factors:	
High incidence	4.8
Low incidence	3.3
Inverted flight	1.8
Nose dive	1.8
Est mated performance with normal load of 3,000 lb	
High speed	118 m.p.h.
Cruising speed	100 m.p.h.
Stalling speed	52 m.p.h.
Climb	400 ft.p.m.
Ceiling	14,000 ft.

Horizontal flight on one engine will be possible with a load of 2,500 lbs.

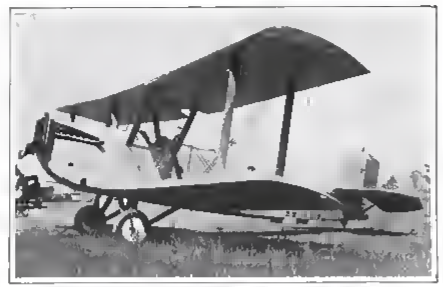
The long distance type of Sikorsky Amphibian can be loaded with safety up to a gross weight of 8,500 lb. The load factors as well as the stress analysis were made for total gross weight of 8,500 lb.

Estimated performance with gross weight of 8,500 lb.:

Cruising speed	96 to 100 m.p.h.
Climb	300 ft.p.m.
Ceiling	11,000 ft.

With 1,500 lb. of crew and equipment the plane will have a range of 1,800 to 2,000 mi.

For Peruvian Airmen



A Douglas Torpedo plane (Liberty engine) interchangeable twin pontoons or wheels, recently ordered by the Peruvian Government for use in the Peruvian Navy. Two planes of this type were ordered and will be shipped to South America shortly.

Schlee and Brock Complete First Leg Of Round-the-World Flight

Pilot "Pride of Detroit" From Harbor Grace, N. F., to Croydon, England, in 23 Hr. 21 Min.

EDWARD F. SCHLEE, Detroit business man, and William S. Brock, former air mail pilot, successfully completed the first leg of their flight around the world when they landed safely at Croydon airdrome, England, at 5:35 A.M. (New York time) Sunday, Aug. 28, after a 23 hr. 21 min. non-stop flight from Harbor Grace, N. F. The plane that they piloted was the Stinson-Detroiter monoplane (Wright Whirlwind) that recently won the 1927 National Reliability Tour and later named the "Pride of Detroit".

Ideal weather conditions prevailed at Harbor Grace as the fliers climbed into their plane which had been placed at the head of the 4,000 ft. runway. The plane carried a total load of more than 5,000 lb. of which some 2,000 lb. was fuel. After a twenty minute tuning test of the engine the chocks were pulled from in front of the wheels and the yellow painted monoplane started down the runway. The take off was perfect and in a short time the plane had gained altitude and was heading out over the North Atlantic.

According to statements made by the fliers, upon their arrival at the English destination, the good weather held until after sunset when it began to rain. The storm increased in velocity and during the last three hours of darkness they

The 'Pride of Detroit" taking off during a recent flight at Curtiss Field, L. I.

were flying in a terrific down pour that slashed at the windows and seeped in over the windshield. In an effort to get above the storm they climbed the plane to a 10,000 ft. altitude, but when the thermometer registered 29 deg. they descended to a lower level for fear that ice might form on the wings.

The Pride of Detroit was first reported during the night as being some 400 mi. west of Ireland, and at 8 A.M. (London time) it was sighted over Plymouth, England. Half an hour later the coast guard station at Padleigh Seltern, Devonshire, reported that the fliers had passed over and dropped a message requesting that the name of the location be written in the sand. The request was fulfilled and at 10:35 the plane was glided to earth on the Croydon airdrome.

The plane was fueled with 385 gal. of gasoline and 15 gal. of oil when it took off at Harbor Grace. About 85 gal. of gasoline remained in the tanks when Croydon was reached, and only two gallons of oil had been used during the flight. An inspection proved the plane and its Wright Whirlwind engine to be in excellent condition.

The route and number of miles to be flown by Schlee and Brock in their round-the-world flight follows:

City	Miles.
Harbor Grace, Newfoundland.	
London, England	2,350
Stuttgart, Germany	480
Belgrade, Yugoslavia	810
Constantinople, Turkey	600
Aleppo, Syria	530
Bagdad, Iraq	485
Bender Abbas, Persia	885
Karachi, India	710
Allahabad, India	520
Calcutta, India	485
Rangoon, Burma	825
Tourane, French Indo-China	800
Hongkong	890
Tokio, Japan (radio beacon)	1,820
Sand Island of Midway Islands U. S. (radio beacon)	2,480
Honolulu, U. S. (radio beacon)	1,440
San Francisco, U. S.	2,400
Cheyenne, U. S.	935
Chicago, U. S.	985
Detroit, U. S.	257
Harbor Grace	1,550
Total mileage	22,087
Estimated number of flying hours	240

No Word of Georgia to Brazil Flier

As AVIATION goes to press no authentic word has been received as to the whereabouts of Paul Redfern who took off from Glynn Isle Beach, Brunswick, Ga., at 12:46 P.M. Thursday, Aug. 25, in a Stinson-Detroiter monoplane (Wright Whirlwind) to attempt a 4,800 mi. non-stop flight to Rio de Janiero, Brazil. The only report of the plane having been sighted during its flight was received on the first night from a steamer that gave its position as being east of the Bahamas.

Before taking off Redfern had expressed the opinion that his gasoline load of 516 gal. would enable him to stay aloft, barring accident, for about 52 hr. The flying schedule mapped out had called for his arrival in Rio de Janeiro around 2:30 P.M. Aug. 27. Just where the young pilot was forced to come down is a matter that has aroused considerable discussion among those familiar with the route. Some believe that he was blown off his course and forced to land on the northern coast of South America, or else on one of the islands near Trinidad, while others express the belief that he came down in open water.

If he did land on the water and was able to dump his fuel supply, the Stinson-Detroiter monoplane will stay afloat until it goes to pieces. Included in the equipment that Redfern carried with him was a rubber life raft and food supplies that will last him for ten days.

In an effort to locate the missing airman radio stations are keeping in touch with ships on the course and the West Indian Islands. Edward Nramer, head pilot of the Biscayne fliers at Miami is preparing to send three seaplanes over the course which Redfern had scheduled to fly the first night, and Coast Guard cutters now operating in the waters of the Bahamas have been ordered to assist in the search.

Reward Offered for Missing Waco 10

The Advance Aircraft Co., of Troy, O., has announced that a reward of $300 will be paid to anyone supplying information as to the whereabouts of a Waco 10 belonging to T. H. Gurley of Philadelphia, Pa. The engine number is 8229 and the plane number is 877. The air speed indicator tubes are in the right upper wing. The under engine cowling is missing and there are two dents in the linen on the lower left side of the rudder. The fuselage and cowling are painted two tone green, and the wings and tail surfaces aluminum. The engine is equipped with two Scintilla magnetos, a glass oil level gauge on the right side of the crankcase, and Splitdorf mica spark plugs. There is a Star toothpick propeller, a double Dixie ignition switch, and a Dixie booster magneto.

Quantity Production of Fairchild Pontoons

By ARCHIBALD BLACK

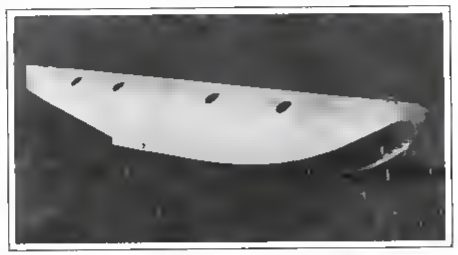
Consulting Engineer, Fairchild Aviation Corp

REALIZING THE increasing tendency of airplane manufacturers to buy their auxiliary equipment and to concentrate their manufacturing effort on the airplane itself, the Fairchild Aviation Corp. decided to engage in pontoons construction upon a production basis. The work is being carried on by the metal boat division of the Fairchild Airplane Manufacturing Corp. Production on a large scale is contemplated, the company having secured for this purpose an additional building located at Farmingdale and of the modern saw-tooth roof type, having 30,000 sq. ft. of floor space. This large expanse of floor space—which is being rapidly filled as production gets under way—is reminiscent of the days of war production.

Advantages of Specialized Manufacture

It is just as logical for an airplane manufacturer to buy his pontoons as his engines and instruments, hence this new undertaking should prove quite successful. Hull shapes are costly to develop, to say nothing of the specialized knowledge and experimental experience necessary. The economy of standardized production and advantages of interchangeable parts are well known. Specialization obviously leads to a higher grade of product, not only because of the intensified study of the problem involved but also because workers obtain a greater familiarity of the product itself and get more experienced at their work. Still another advantage of the specialized manufacture of floats lies in the fact that the relevant knowledge accumulated can be applied also to the proper fitting of the pontoons to the airplane. No matter how high-grade pontoons may be, if not properly attached to the airplane, their performance will be unsatisfactory. The Fairchild engineers, through their extensive experience are able to specify the exact float position for attachment and are willing to guarantee the result.

The Fairchild experience, not only in design and manufacture, but also in the actual operation of seaplanes, places this firm in a splendid position to undertake the building of floats for airplane constructors. To obtain practical experience with riveted metal float construction, The Fairchild Aviation Corp. purchased the Aeromarine all metal flying boat together with the drawings and design rights. In addition to the experience gained in operating this flying boat in Florida for several years, and also in the operation of many seaplanes in Canada for over five years, Sherman M. Fairchild



Three quarter front view of finished pontoon

went himself to Europe in 1926 and there visited all the metal boat and pontoon factories. In this tour he had an excellent opportunity to compare scientific and practical data over a wide range of conditions.

All active manufacturing operations on pontoons are directly under the supervision of A. R. Stalh, chief engineer. Mr. Stalh has been connected with various phases of development, design and manufacture of floats since 1915. In addition to being a Naval Architect, he spent five years under Comdr. H. C. Richardson, U.S.N., in model basin, wind tunnel and development work on floats. He gained further

A Fairchild all-purpose cabin seaplane being launched. Note the mechanics in the act of removing the wheels

A Fairchild all-purpose cabin monoplane taxiing on the water

practical experience along this line as engineer for the Loening Aeronautical Engineering Corp., and at the Brewster Company, where he specialized in the development of all-metal floats for the Navy. He also spent a year in the Navy Flying Service as Flight Engineer.

Manufacturing methods in the "Metal Boat Division" are similar to those found so successful at the parent concern, The Fairchild Airplane Manufacturing Co. Jigs and fixtures are installed throughout and progressive assembly is being employed. The integral parts are turned out at one side of the factory and gradual assembly takes place until the float is completed at the opposite side. Already ten sets of pontoons are in production, the output being one set per week. A most rigid inspection of both raw materials and parts in progress is maintained and every effort made to ensure absolute uniformity as well as a high grade product. Special jobs such as hulls, wing floats and pontoons of a special nature will occupy a section of the factory on one side reserved for this purpose.

Of Interesting Construction

The Fairchild pontoon is of most interesting construction and has some distinctively novel features. While essentially a metal pontoon, it is built upon a staunch framework of wood and metal. This framework is made up of members held firmly together with bolts and gusset plates of duralumin. High strength with low weight are obtained by utilizing a center frame in the form of a Pratt Truss. In this way double safety is realized since either the metal covering or the internal framework has sufficient strength alone to withstand most of the load. Two transverse reinforced duralumin bulkheads serve to not only divide the float into watertight compartments, but are located under the points of attachment thus serving only to distribute the load thoroughly. Danger of concentrated stress action is further materially decreased by the ability of the internal wooden members to dissipate the shock locally.

These pontoons are perhaps the first to be built commercially in America with concave bottom. In contrast to the straight V bottom ordinarily used, many advantages result from this unique construction. The curve in the bottom adds so much longitudinal strength that longitudinal members in the bottom have been entirely dispensed with. The forward part of the bottom (where the greatest stresses occur) has a double curvature which gives the metal sheeting a degree of stiffness comparable with that of a disc wheel.

Tests made at New York University proved in a scientific manner the remarkable strength of this type of pontoon. Prof. Alexander Klemin, who supervised these tests, commented in his report —

"In the strength tests [illegible] various loads were applied over a section of the bottom forward of the step. Although loadings were increased to 2162 lb. per sq. ft. no dangerous permanent set resulted and there was no evidence of rippling." This is over double the Navy requirements for strength.

Another important advantage of the concave float bottom (in contrast to the straight V bottom) is that the direction of the spray is changed. Instead of being thrown upwards, it is deflected down towards the horizontal and thus clear of the bottom of the fuselage and clear of the propeller. With the usual flat V bottom, the two streams of spray in a twin pontoon installation meet at the center and are usually thrown upward into the propellar and against the fuselage and tail.

Mention should be made of the method of shaping and joining the duralumin sheet. Before bolting the metal to the frame it is heat treated and formed to give it the desired convexity or concavity so that no internal stresses are created in the material during construction. The metal is so arranged that joints are located only where it is bolted to the frame.

Showing method of attaching strut on top of float

The chine joints are further strengthened and protected by an external strip of duralumin. All joints are sealed by means of a packing consisting of cotton tape impregnated with a marine glue which remains permanently plastic. This packing is inserted between each of the elements at every joint. It is practically impossible for water to get through a joint of this kind under normal conditions as it would have to work through the packing under the external strip and then (turning back under its former path) through the packing between the metal sheet and the frame. Even should such a leak occur, the natural swelling of the moistened wood helps to close the leak. This is the same action as that upon which all motor boats depend entirely for watertightness and its combination with the method of joining make the floats

completely watertight. In practical tests they have been moored out in the open for months and yet have remained absolutely dry.

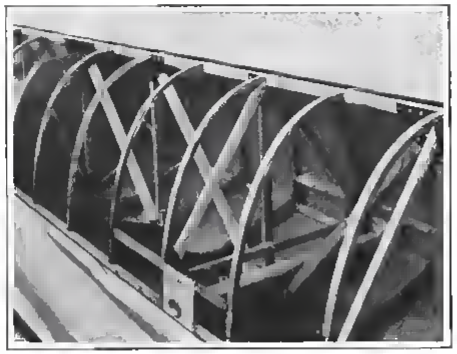
The Fairchild Company feels that they have taken quite a step forward in getting away from the use of rivets in metal float construction. Rapid corrosion of duralumin rivet heads in floats is probably caused not only by their projection and roughness (which facilitate this action) but also because the hammering in upsetting the head tends to change the character of the metal even if the rivets are heat treated just before use. This internal stresses may be created which offset the effect of the heat treatment. Moreover, rivets are rarely uniform after driving and a percentage of them is usually found to be slightly defective. The special bolt developed by The Fairchild Company is not only of high uniform strength but the head is smooth, flat and of the same metallurgical character as the covering itself. This head is said to retain its protective coating very well, offering the minimum opportunity for local corrosion. In practice these bolts have been found to stand up well under the most severe conditions and have demonstrated their ability to resist corrosion.

Nose of Pontoon is Separate Unit

Both all-metal and all-wood floats have their weak points as well as their strong ones and the composite construction combines the advantages of each without incurring their disadvantages. Metal floats have but little resilience, the members are liable to vibrate and riveted seams are liable to become loose and to leak. Wood floats are free from some of these troubles, but they absorb water to such a degree that their weight is seriously increased. There is also more danger in hitting driftwood as planks may be torn loose from the bottom. In the composite or "reinforced duralumin" construction as the Fairchild engineers term it, resilience is greatly increased, vibration overcome, rivets avoided and absorbtion completely eliminated.

Perhaps the most interesting features of all are the various points of practical refinement which the Fairchild engineers have incorporated in these floats. The nose, for instance, is a separate unit of canvas stuffed with kapok made by a special molding process. An excellent streamlined form is thus obtained and, as the forward portion of a pontoon is largely responsible for determining its aerodynamic characteristics, this is an important advantage. This type of nose also has the advantage of providing a built-in spring which will save the float from damage in case of collision, not only by acting as a bumper but also by relieving the various members from concentrated action. Another practical refinement is in the keel protection. In addition to being reinforced specially at the step, an extra heavy strip of duralumin is fastened over all to take the wear and this piece is secured in such a way as to permit easy replacement.

The removable walking strip is a particularly valuable feature as its removal affords access to the entire length of the float through a nine inch opening. The importance of convenient access to any part of the float is a feature which should interest the operator and its value has already been proven in service. Unusual care is exercised in applying the protective coating to all members both before and after assembly. Every part down to the smallest fitting is thoroughly cleaned and prepared to receive spar varnish or asphalt paint so that the finish applied will adhere firmly and will not blister. Another very useful feature is found in the tube built through each pontoon just forward of the step. For

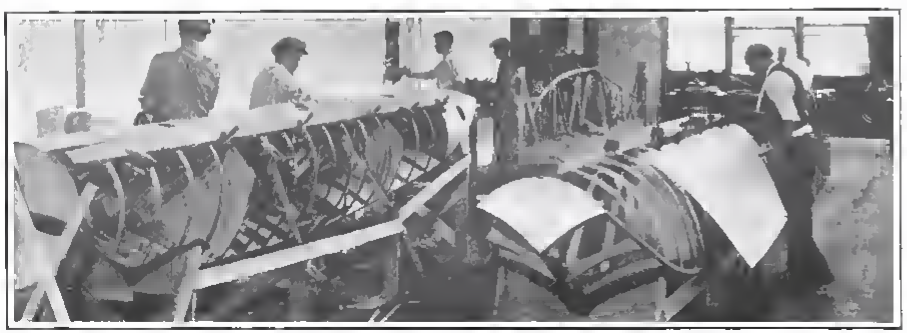


Showing internal construction and wheel axle socket.

beaching purposes axels may be inserted into these tubes and wheels slipped on to form a thoroughly practical beaching gear which does away with handling trucks.

In the design special care has been taken to have the strut bracing fair into the deck of the float so that the resistance of strut fittings and the effect of interference between the floats and their struts is reduced to the minimum. This is done in the twin float installations by building cups into the deck of the floats which form indentations into which the struts are fastened. This arrangement has the advantage of being external as far as bolting up is concerned, yet (from an aerodynamic viewpoint) it is equivalent to an external fastening, as the junction of the cross spreaders and the main struts and also the attachment fittings are faired by being included within the contour of the float.

Fully as important as the way pontoons are constructed, is the way they are mounted. Twin pontoons are subject not only to weaving stresses but to a tendency to rotate. In the Fairchild construction these conditions have been squarely met by the use of heavy streamlined cross tubes running between the floats and securely fastened to them. This construction is further strengthened by the cross wires run in



A corner of the new Fairchild pontoon factory at Farmingdale L. I.

each of the three planes and effectively eliminates the weaving and rolling. As designers well know, proper mounting, both as to position and angle of the pontoons on the airplane is most important. Unless properly mounted the airplane will not handle well on the water and will tend to porpoise. In extreme cases it is even difficult to take off at all. In the past it has often been necessary to use "cut and try" methods in mount pontoons. Through their experience the Fairchild have eliminated the necessity of such crude methods and will work out applications of floats so that they allow the airplane to handle properly when flown for first time. This offers a great advantage to manufacturers of airplanes who have not had extensive experience with floats. Cut and try methods are not only expensive but even after considerable experimental work, the results may not be entirely satisfactory.

Pontoons Are Absolutely Watertight

From an operation standpoint these pontoons are performing excellently being absolutely watertight, thoroughly reliable and of extremely rugged construction. The points of greatest wear have been given additional strength and most of such parts are easily replaceable. Captain Saunders of Fairchild Aviation Ltd who has used a pair of these over 50 hr. in Canada, states that they are still as dry inside as when they left the factory. In fact, he reported that no sponging has been needed at all. Sets of the Fairchild pontoons have been ordered by the Department of National Defense of Canada and by the West Indian Express.

While the structure of these Fairchild pontoons is excellent their performance in the water and in flight seems to be equally good. They offer so little additional resistance over that of the land gear that airplanes so equipped are said to have made speeds within two to four miles of the speed they previously made as landplanes. The quick take off as well as the cushion effect at landing result from the convex surfaces of the bottom. The horizontal section of the chine gives an excellent planing surface, and the tip of the V enters the water first and serves to break the shock. Because of their high freeboard and ample reserve buoyancy, the Fairchild pontoons have been found to take off and land perfectly even when the wing loading is abnormally high or when they are over-loaded 20-25%. In the water the high crown deck makes them most seaworthy while the ample length gives unusual maneuverability.

Several Sizes Now in Production

Commenting on these floats after a flight demonstration L. M. Merrill of Curtiss Flying Service, said: "They are particularly advantageous at take off and landing. They permit one to take off easily and quickly, while on landing, they cut the water well and there is no spanking. I attribute this to the bottom where curved surfaces take the place of the usual flat sides of the 'V'. This also has the effect of throwing the spray horizontally and keeping it out of the prop., which in a two float job is mighty important."

Several sizes of floats are now in production (or going into production) at the Fairchild factory, those being suited for airplanes ranging from 2,000 to 4,250 lb. gross weight. One size is specially built for small airplanes like the Waco. Orders have been received from various sections of the United States, Canada, Mexico and the West Indies and both the number of types and the total production are being increased to meet the need. It is also probable that a small flying boat will be brought out soon.

Manufacturers and users of airplanes should welcome the entrance of such firms as Fairchild in the field of pontoon manufacture. In buying a product of this kind, the grade of organization manufacturing it, and the methods and standards employed in its manufacture, mean far more than a set of specifications or the word of an inspector. It also means much to purchasers to be able to obtain quick delivery of standard floats of known quality and performance at a reasonable cost. Lastly, and most important of all, the user may now have the assistance of a skilled factory engineering staff with the advantage of their accumulated experience in fitting pontoons to their ships and in solving problems which might arise. Thus, in this way, the Fairchild organization hopes to promote safety and high performance in pontoon "jobs" as well as ensure a high grade in the floats themselves.

The Gloster "Goral" Reconnaissance Plane

The Gloster "Goral" is a two-seater British reconnaissance and bombing machine fitted either with the Jupiter series VI or the Jaguar series IV engine. The structure throughout is of steel with fabric covering. The machine has a number of new and interesting features, which render it a very serviceable type. The fuselage, for example, consists of three detachable units, each of which may be packed into a case of very moderate dimensions, making the transport of the aircraft an easier and less expensive business. These

Front quarter view of the Gloster "Goral" an English two-seater reconnaissance and bombing plane.

units include the forward portion, with engine installed complete, middle portion including fuel tanks and cockpits, and rear portion with tail skid assembled and control wires threaded through. All tubes and fittings are rustproofed inside and out before assembly.

Another interesting feature is that joints have been so formed that any steel tubular member can be replaced by a wooden member.

Several important units of the structure, including the wings, are interchangeable with the D.H.9a type. Fully loaded, with 100 gal. of gasoline and 100 lb. useful load the Goral has a range of over 750 mi., and an excellent all round performance. It is built by the Gloster Aircraft Co., Ltd. of Cheltenham, Gloster, England.

Plans Drawn for Brooklyn Airport

The Gibbons Co. of New York City has drawn up elaborate plans for the construction of an airport in Brooklyn, N. Y. The proposed terminal for Brooklyn's aeronautical activities is to be on a peninsula in upper New York Bay between the present Naval Supply Base and Governor's Island. The airport is within easy reach of both the New York and Brooklyn post offices.

It is proposed to have service hangars for 150 planes, a dirigible hangar and mooring mast, balloon hangar, passenger and freight depot etc. Eighty per cent of the area is graded. It is stated that the balance can be graded for the landing of airplanes, pending the construction of the hangars, inside of six weeks.

Novel Method of Training Pilots

The K. L. M. of Holland are employing a novel method for training pilots for flying in fog or at night. A standard plane of the Royal Dutch Air Lines is used. It is equipped with dual control with one cockpit so arranged that the pilot can see nothing but his instrument board. He then flies the plane for long periods under the guidance of the other pilot whose vision is normal. In this way a pilot becomes familiar with flying under conditions of poor or no visibility.

Sixteen Entries for Bennett Cup Race

Plans are practically complete for the Gordon Bennett Cup balloon race to be held at Detroit, Mich., on the tenth day of this month. Sixteen balloons, representing eight different nations will take the air in the event which marks the 144th anniversary of free ballooning.

The prevailing winds from Detroit are northeast, which makes it not improbable that residents of Northern Ohio, New York, and New England will catch a glimpse of the great bags as they follow these air current lanes. At times the wind blows southeast, in which event they would be carried across country to a landing on the South Atlantic Coast. The rules state that the race must start at the time specified regardless of weather conditions.

Although a complete list of pilots for the various entries has not yet been received, America will be represented by Ward T. Van Orman, the winner of the 1926 race, Edward J. Hill of Detroit and Capt. W. E. Kepner of the United States Army. The pilots for Germany are Fritz Eimermacher, in

Left to right: Hon. Henry S. Hulbert; Ward T. Van Orman and Roy Cooper grouped around the Gordon Bennett trophy to be competed for at Detroit on Sept. 10.

private life, an oil merchant of Muenster, Dr. R. Halben, an eye specialist of Berlin and Hugo Kaulen, a manufacturer from Barmen. Kaulen holds the world long distance flight record, made in 1913, when he with two passengers covered 1,865 mi. Great Britain will have three pilots in the basket of the single entry. They are Squad. Leader, R. S. Booth, Capt. G. F. Meager and Reserve Fl. Lieut. M. H. Steff. The balloon that will represent Great Britain is known as "The Bee". It is of 80,000 cu. ft. capacity and was piloted in the 1926 contest by Captain Meager. Lieutenant Steff was the second pilot, representing England in that event and Flight Leader Booth was the officer responsible for the return of the R-33 when it broke loose and drifted over the North Sea. The Bee is the first balloon to arrive in Detroit and is now safely housed in a warehouse there awaiting the arrival of the crew.

The Italian entries are the "Rex" and the "Dux" and their pilots will be Col. D. Leone, Col. U. Medori, Col. A. Beghi, Maj. G. Peonessa, Maj. E. Flari and Lieut. A. Gelato.

Hon. Henry S. Hulbert, presiding judge of the Probate Court, is chairman of the Gordon Bennett Committee of 1927. Other members of the body include Hon. Charles B. Warren, Ex-Ambassador to Japan; Edsel B. Ford, Hayward Murphy, Phelps Newberry, Thomas S. Merrill, secretary General Motors Corp.; Col. Sidney D. Waldon, William B. Mayo, Carl B. Fritsche, Charles A. Parcells, William P. Harris, Harold H. Emmons, William B. Stout, J. W. Batton, Charles R. Talbot, John M. Stalker, A. C. Vose, L. K. Marshall, Ralph H. Upson, Norman B. Conger, Harvey Campbell, Alfred C. Verville, Charles D. Williams and Karl S. Betts. Ray Cooper, manager of the 1927 National Air Tour, is the general manager.

Atlanta-New Orleans Contract Awarded

According to a recent oral announcement of Postmaster General New, the St. Tammany Gulf Coast Airways, New Orleans, La., has been awarded the contract for carrying air mail over the newly established route between Atlanta, Ga., and New Orleans, La.

The new line when formally placed into operation will connect with the line to be operated by Pitcairn Aviation Co., Inc., of Philadelphia, Pa., on the proposed route between New York City and Atlanta, Ga., thus affording a quicker mail service between the cities named.

The Post Office Department expects the new contractor to begin actual operation of the route between New Orleans and Atlanta, Ga., within six months. The St. Tammany Gulf Coast Airways firm will be paid $1.75 per pound for the mail carried. Service on the New York City-Atlanta route will begin probably Nov. 1, according to Department officials.

Last of Government Mail Planes to be Sold

The last of the government air mail planes, 9 rebuilt De Havillands, are to be sold by the Post Office Department, according to an announcement made by Postmaster General New. Advertisements were issued recently inviting sealed proposals on these planes returnable at noon, Tuesday, Sept. 13.

The planes are not the same as the D.H.'s used by the Army but have been rebuilt by the postal service at the air mail service repair depot at Maywood Field, Chicago, and are all in good flying condition.

They are held by the pilots who are using them as the best planes in the service from the standpoint of stability and ruggedness. At present they are scattered from Bryan, Ohio, to San Francisco.

Notice to Pilots

A ditch 500 ft. long, 8 ft. wide, and 6 ft. deep is being excavated on a line running due south from the west end of the landplane hangar warming up platform at the U. S. Naval Air Station, Anacostia, D. C. This ditch is marked during the day with red flags and at night with red lanterns.

The ground for a distance of 600 ft. on both sides of this ditch is too rough for landings and should also be avoided.

There is ample room for landings and take offs to the south of this ditch where the field is in excellent condition.

Recent Awards of the Aeronautics Branch

The following are recent awards made by the Aeronautics Branch of the Department of Commerce:

One electric plant, automatic airway beacon; The Kohler Co., Kohler, Wisc. $626.85. Four adjustable blade, steel propellers, Hamilton Aero Mfg. Co., $1,240.00. One three-place biplane, light commercial; E. M. Laird Airplane Co., Inc., $21,600. 250 gal. Mobile oil B for air-cooled engines; Vacuum Oil Co., $185.15.

Stock Control in Aircraft Manufacturing

By WILLIS PARKER

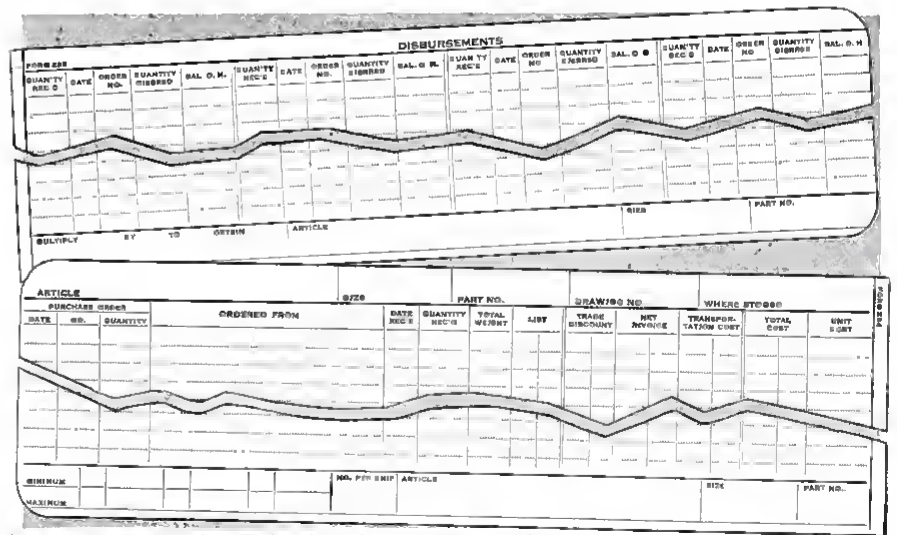
MAINTAINING an accurate balance on the inflow of raw materials and the outgo of the finished product is highly essential to a reduction of costs in the manufacture of airplanes, according to D. M. Alexander, vice president and engineer in charge of production at the plant of the Alexander Aircraft Co., Denver, Col. Control must be almost absolute, for there must be no delay in any department through the failure to deliver materials to that department and likewise there must not be too much material on hand because that ties up money in stock, requires storage room, which, in turn, demands a rental value and the space might better be used for construction purposes. The ever changing market conditions, the improvements in design of airplanes as units and their various parts necessitates watchfulness that too much of any material is never on hand, lest that material or that part become obsolete in a short time and the stock on hand become a liability.

To control materials and parts, the company has an extensive perpetual inventory system. This is backed by carefully prepared and checked requisition blanks and order forms to be used for ordering from stock, for outside purchases and for the manufacturing of parts in the company's own machine shop.

The perpetual inventory plan is confined to a loose leaf binder and each and every one of the 1400 parts that are required for the manufacture of one of the planes is indicated on a separate card—two cards in fact. One card is a yellow sheet and contains the record or history of each and every purchase for stock. This history includes the date of each purchase, the order number and the quantity, from whom it was ordered, the date received, quantity received, total weight, list price, trade discount, net invoice, transportation cost, total cost and unit cost. Also on this sheet is the information as to where the stock is stored, as well as other detailed information such as the size of the part, the part number, and number required for each ship. Just opposite this sheet, which is printed on yellow stock, and facing it, in such a manner that it is not difficult to read the record as provided by the figures and notations on both sheets, is the disbursement sheet, printed on white stock. This merely indicates the quantity received and date, the order number, the quantity disbursed and the balance on hand. On the margin is indicated the order point, the danger point, the maximum permitted to have on hand at any time and the number that may be ordered at a time.

D. M. Alexander, vice president and engineer in charge of production of the Alexander Aircraft Co.

This book is the controlling medium of materials and supplies and it is carefully checked to determine the rate of turn-over with the point always in mind to increase the num-

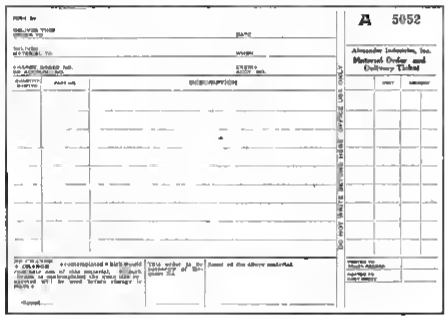


A view of the disbursement sheet printed on white stock. At the bottom is the sheet printed on yellow stock on which is recorded data relating to the purchase of parts. A set of these sheets, which are filed face to face, is kept for every part required in the manufacturing of the plane.

her of turn-overs in stock so that there never is too much stock on hand at one time Some supplies are ordered once a week, others are ordered once a month and there are several items that are ordered twice a week The ideal situation is to get the supplies coming in once a week or at least twice a month, for this prevents tieing up large sums in materials.

The clerk in charge of this book takes the carbon copies of all orders for stock and all requisitions from stock and checks them into the book daily. As he checks them in, he notes the balance of stock on hand and sees to it that the danger point is never reached Also, he watches the rate of turn-over and when he notices that a certain item is moving out of stock so slowly that it might be ordered less frequently, he so informs the purchasing department

The machinery of the order department is started by what is known as a requisition for material for work This may come from any department of the institution and goes direct to the order department The form provides for listing the description of the article and the amount desired as well as the determined maximum and the permissible minimum and the amount on hand This serves somewhat as a check against the perpetual inventory system, for, by comparing the figures of the amount on hand, the order clerk can determine whether or not there should be stock on hand in excess of the amount



Stock on hand order form Almost the same as order on purchasing department.

indicated on the requisition blank, and if there should be an excess, he takes measures to ascertain what has become of it —whether it has been mislaid in the stock room of the department requesting the material or whether it has gone astray. Since this requisition serves also for new materials or for labor, it is not always compared to the inventory record.

When the order department receives the requisition they determine whether it is an outside purchase or whether it is an order on the stock carried by the firm, or whether it will have to be manufactured in the company's machine shops. In case it is an outside purchase, an order on the purchasing department is made and sent to that department This order is made out in triplicate, the original going to the purchase department, the first carbon going to the receiving clerk to inform him that he may expect the material and to check it with the invoice when the shipment is received, and the second carbon is retained in the order department for future reference as needed.

In case it is an order for stock on hand, it is made out in duplicate, the original going to the department where the material is held and the carbon retained in the order clerk's file to check against the perpetual inventory.

There is a note at the bottom of all of these orders saying: "A Change (No Change) is contemplated which would eliminate use of this material. (If such change is contemplated the quantities requested will be used before change is made)".

This has the tendency to prevent accumulation of extensive stocks of materials which could not and would not be used later owing to the change.

With the expansion of the factory and the increase in number of planes produced weekly, there is a problem of keeping on hand sufficient material to meet the demands of increased production. And, while this necessitates continual changes being made in the minimum and maximum amounts to be carried per given period of time, it also serves to prevent a failure of the purchasing department and factory department to keep up with the demand for materials, for it is always possible, through the perpetual inventory system to watch the rapidity with which the stock moves

Factory production is controlled in a similar manner,—that is, the production of the machine shops in the manufacture of the many parts that the firm makes itself This control is essential for the purpose of preventing overstocking when there is always a chance that a change in the design will be ordered The machine shop should produce only enough of each manufactured part to keep the assembly plant working at top notch, and yet, it is essential that the stock of these parts should never get so low that it will be necessary to change over a machine in the midst of one operation to handle an emergency order for additional parts of another kind

Obviously, then, the perpetual inventory record controls the entire plant. All airplanes are assemblies of numerous parts and materials plus the labor Stripped of the labor the turnover of airplanes, then, is the turnover of parts and materials, and since profits are made from the rapidity with which stock turns over, it can be seen how essential it is, then, to watch the turnover of the raw materials coming into the plant

Bids Opened for Three Air Mail Routes

Eight bidders contested for three new air mail routes, bids for which were opened in the office of Postmaster General New on Aug 18

Five bids were received on the route from Atlanta to New Orleans, two on the Cincinnati Indianapolis Chicago route, and one on the St Louis-Memphis route.

The routes, names of bidders, rate of bid, and type and number of planes proposed to be used follow

ATLANTA, GA. TO NEW ORLEANS, LA. Via BIRMINGHAM AND MOBILE, ALA

Bidder	Address	Amount	No. of Planes	Type of Plane		Reserves
Embry Riddle Co.,	Cincinnati	$2 81	5	Whirlwind	Waco	0 in reserve
Pitcairn Aviation Co.,	Phila	2 47	5	Pitcairn		0 in reserve
LA Airways, Inc.	New Orleans	2 00	4	Ryan and	Fisso	2 in reserve
St Tammany Gulf Coast Airways,	New Orleans	1 75	5	Waco and	Fokker	3 in reserve
Arthur E. Cambas,	New Orleans	2 95	4	Douglas and 1 Seaplane to be used between New Orleans and Mobile		2 in reserve

CHICAGO, ILLINOIS TO CINCINNATI, OHIO VIA INDIANAPOLIS, IND.

Central Airways, Inc.	Indianapolis	$2 48	3	Stinson		1 in reserve
Embry Riddle Co.,	Cincinnati	1 47	4	Whirlwind	Waco	2 in reserve

ST. LOUIS, MISSOURI TO MEMPHIS, TENN.

Robertson Aircraft Corp.	St Louis, Mo	$3 00	6	D H 4s		4 in reserve

N.A.A. Convention at St. Joseph, Mo.

The 1927 Annual Convention of the National Aeronautic Association will be held in the city of St Joseph, Mo., on Sept 19 and 20. Convention headquarters will be at the Hotel Robidoux and in addition to the usual business session there will be a banquet and election of officers for the ensuing year.

As the National Air Races are this year being held in the city of Spokane, Washington, on Sept 23 and 24, the dates fixed for the Convention were selected with a thought in mind that delegates and others attending the Convention could go on from St. Joseph to Spokane for the Air Races with a minimum loss of time. It is expected that most of those attending the Convention in St Joseph will proceed to Spokane because of the very great interest in this year's National Air Races and the Air Derbies from New York to Spokane and San Francisco to Spokane.

The Pitcairn Mailwing

A High Performance Mail and Express Carrying Plane Designed Around The Wright Whirlwind Engine and Equipped for Over-Night Service

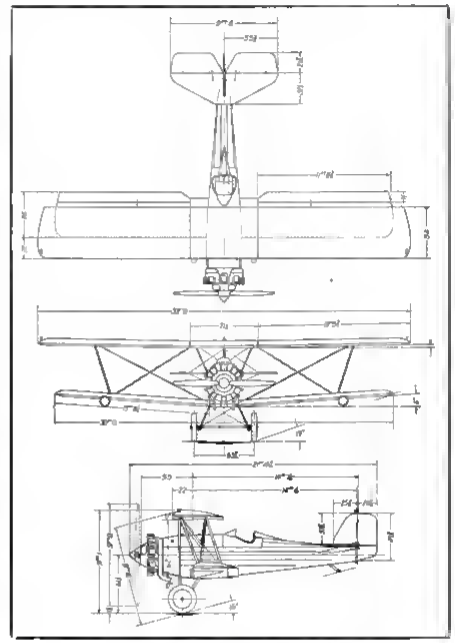
THE PITCAIRN MAILWING, which was produced primarily for service on the New York Atlanta Air Mail line, is the fifth original design developed by Pitcairn Aircraft, Inc., since the inauguration of Pitcairn aviation activities a little over three years ago The conception of the P. A. 5, as the Mailwing is designated, was based upon the need for a small load carrying airplane with a high performance. The machine was designed with full recognition of the fact that, at least, during the early stages of the development of the New York-Atlanta Air Mail service, for the operation of which Pitcairn Aviation, Inc., holds a contract, the mail loads will be somewhat limited Therefore, to employ on the service aircraft the load carrying capacities of which are far in excess of the demand, would be to the detriment either of cost of operation or of performance.

In spite, however, of its high performance, the Mailwing easily carries from 500 lb to 600 lb of mail or express matter, while the cubic capacity of the mail compartment, namely, 26 cu. ft., is sufficient to ensure accommodation for at least 200 lb of the very bulkiest mail matter. No provision is, however, made for passengers, although in cases of emergency, sufficient accommodation could be made available for one person.

The Pitcairn Mailwing is equipped with a 200 hp. Wright Whirlwind J-5-C air cooled engine giving it a high speed of 136 m.p.h and a cruising radius of about 600 mi at 1950 r.p.m.

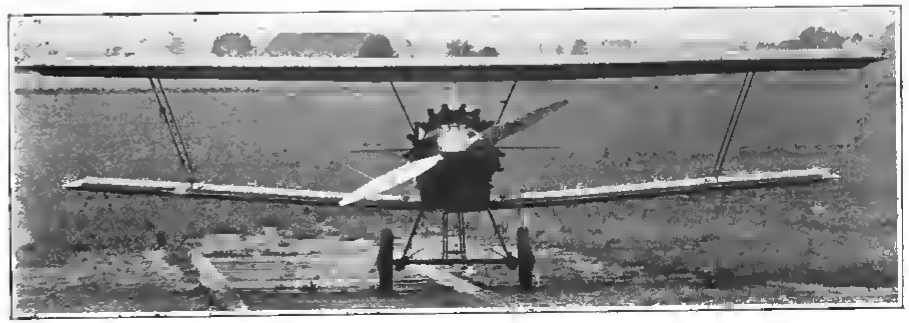
The fuselage of the P. A.-5 is very similar in general construction to that of the P. A.-4 which was fully described in AVIATION on June 27, 1927 As has been the practice in recent Pitcairn construction, the longerons are of square steel tubing. The material is approximately one inch square in section with round corners and has the great advantage of materially simplifying the process of welding. The structure is a normal Warren truss, with round section tubing used for the cross members. The whole principle is very economical construction while at the same time being thoroughly trustworthy in design from the strength standpoint

The mail compartment is situated in front of the pilot's cockpit and partially under the gasoline tank and is supported at the base by a sheet of three-ply wood covered with .035 gauge duralumin The sides of the compartment are formed of .051 duralumin while an aluminum cover, with quick release clips, forms part of the engine cowling. This disposition of the mail load is convenient, for it is so close to the center of gravity that regardless of quantity of mail carried, there is a movement in the C.G. position of little more than one inch Furthermore, by an extremely careful attention to detail design, the entrance to the mail compartment is arranged such that there is no interference of any kind whatsoever with the loading or removal of mail bags, permitting this operation to be carried out with the minimum of delays



Three view drawing of the Pitcairn Mailwing

The wings, which are materially staggered, providing ex-



Front view of the new Pitcairn Mailwing (Wright Whirlwind)

Rear quarter view of the Pitcairn Mailwing The mail pit in front of the pilot can be readily converted into a cockpit.

cellent visibility for the pilot, are of more or less conventional construction, the main and rear spars being of routed spruce members, while plywood is used very largely in the construction of the ribs. Considerable attention has been given to lightness without any sacrifice of strength or rigidity. In fact a load factor for the entire machine as high as 7.5, which is more than that specified by the Department of Commerce for airplanes of this type, has been maintained, one of the objects being to permit the maximum use being made by the pilot of the excellent maneuverability qualities of the P. A.-5.

The wing structure consists of four wing panels, and the center section, the lower wings attaching to fittings on the lower longerons while the upper wings are attached to the wing center section supported on struts from the upper fuselage longerons. The somewhat exceptional width of the center section has the advantage of providing easy access to the mail compartment. Furthermore, due to the wide spacing of the cabane struts, interference with the forward vision of the pilot is reduced to a minimum.

The tail group is constructed throughout of welded steel tubing with 5/16 in. by .035 in. tubes serving as ribs, and is fabric covered. Neither the rudder nor the elevators are balanced. The stabilizer, however, is adjustable in flight from the pilot's cockpit.

The undercarriage of the original plane was a normal Vee type with through axle although in subsequent models a split axle type is fitted. The undercarriage struts are of streamline heat treated chrome-molybdenum tubing, the axle being sprung with normal rubber cord shock absorbers. The wheels are of size 28x4, while the new machines with the split axle undercarriage will be equipped with brakes as standard equipment.

With a view to rendering engine change a rapid and readily accomplished operation, the entire power unit including the five gallon oil tank is mounted on a quickly detachable mount with all gas and oil lines arranged for quick disconnection. The 60 gal. gasoline tank is suspended immediately back of the engine, in the fuselage, in a position such that adequate gravity feed is possible. This fact is of more than passing interest since, in spite of the fuel tank being mounted in the fuselage where all weights are centralized, the feed is by gravity, a system seldom possible except where wing tanks are concerned.

As a safeguard against fire in the air, a pressure Pyrene fire extinguisher is installed with special nozzles distributed back of the engine so as to cover all vital parts. The operation of this precautionary system is controlled from the pilot's cockpit.

The general details of the Pitcairn Mailwing together with the performance, are given in the following table:

Weight empty	1612 lb.
Weight empty, including batteries, landing lights, and parachute flares, etc.	1742 lb.
Total weight	2512 lb.
Wing area	252 sq. ft.
Wing section	Pitcairn development
Overall span, upper	33 ft.
lower	30 ft.
Overall length	22 ft. 10½ in.
Chord, upper	54 in.
lower	48 in.
Mean aspect ratio	7.42
Dihedral, upper wing	1°
lower wing	4°
Gap at fuselage	62 in.
Stagger	22 in.
Area of ailerons (on lower wing only)	21.8 sq. ft.
Area of stabilizer	15.5 sq. ft.
Area of elevators	14.5 sq. ft.
Area of fin	4.2 sq. ft.
Area of rudder	6.4 sq. ft.
High speed	136 m.p.h.
Minimum speed	45 m.p.h.

Front quarter view of the Pitcairn Mailwing to be used on the Pitcairn air mail route between New York and Atlanta, Ga.

Air Program for Paris Legion Convention

Two of the principal events of the American Legion Convention to take place in Paris this month will both be an features arranged by R. C. Wood, chairman of the Aviation Committee of Paris Post No. 1. Two days, Sept. 21 and Sept. 23, have been set aside for the Aviation Committee.

On Sept. 21 the members of the Legion will visit the experimental aviation center at Villacoublay in response to the invitation of the Association des Officiers de Reserve de l'Aeronautique, an organization composed largely of French officers who served in the air service during the World War and who are very desirous of having an opportunity of meeting their former American comrades during the coming visit of the American Legion to Paris.

On Sept. 23 the Legion will visit Le Bourget Airport as guests of the commercial aviation companies of Paris. The veterans also have been invited to the Breguet factory which employs upwards of 2,200 hands and can turn out three finished planes a day. These planes are of metal construction and are manufactured in series. The Breguet Plant is one of the largest airplane factories in the world. It adjoins Villacoublay Field. The Legion has also been invited to visit "L'Ecole Militaire (Military School) et de l'Aeronautique", which is situated at Versailles, just beyond Villacoublay. They are likewise invited to visit other adjoining factories.

Mr. Wood has received acceptance of the invitation to these two aviation features from Brig. Gen. Roy Hoffman, president of the U. S. Reserve Officers Association and commander of the Oklahoma Department of the American Legion.

Special invitations to attend these events have also been sent to Gen. Mason M. Patrick, chief of the Air Service of the U. S. Army, Admr. W. A. Moffatt, chief of the Bureau of Aeronautics of the U. S. Navy; F. Trubee Davison, assistant secretary of war; Edward P. Warner, assistant secretary of the Navy, and William P. MacCracken, Jr., assistant secretary of commerce for aeronautics, as well as Maj. Reed Landis, Comdr. Harry Guggenheim, Capt. Eddie Rickenbacker and other American war time fliers.

Publishes Two Books On Navigation

The U. S. Naval Institute has published two books on navigation; "Sea and Air Navigation Tables" by Comdr. Radler de Aquino of the Brazilian Navy and "Navigation and Nautical Astronomy" by Comdr. Benjamin Dutton, U. S. N.

Commander Aquino's Sea and Air Navigation Tables include, in addition to tabulated data for determining lines of position at sea and in the air, a text with examples illustrating the use of the tables. Commander Dutton's Navigation and Nautical Astronomy was prepared as a text book for use at the United States Naval Academy. It is quite complete including all of the principle methods of navigation.

Ready to Set Her Down

Action picture of the Gloster "Gamecock II", a Royal Air Force single seater fighter powered with a Bristol Jupiter series VI high compression 420 hp. engine and built by The Gloster Aircraft Co., Ltd. of Cheltenham, England. The Gloster Gamecock II is almost identical to the Gloster Gamecock I except that instead of the wings meeting at the center line of the machine a center section has been inserted. The ailerons are of narrower chord and the struts separating them have been moved out to the center of the ailerons. The fuel tanks in the upper wing are wider and do not project as far below the wing thus reducing the drag. It was found that by changing the shape of the windshield the flow of air over the tail was disturbed to a much smaller degree. The plane is of conventional wood construction with longerons of ash, end spars, struts and ribs of spruce. The center section struts are of steel. The landing gear is provided with an oleo rubber shock absorber. There are two Vickers guns at the sides of the fuselage, firing through the propeller. Provision is made for 1,200 rounds of ammunition and for four 20 lb. bombs.

The 1927 Schneider Cup Race

THIS YEAR the Schneider Cup race will be held at Venice on Sept. 25 under the auspices of the Aero Club of Italy. The course as shown by the map is laid outside the lagoon of Venice, off the famous beach of Lido. The circuit consists of a triangle with obtuse angle having a perimeter of 50 km. The vertices corresponding to the two acute angles are located as follows: one on the pier south of the port of Lido, about 600 meters from the shore end of the pier, the other on a float to be located about one km. and a half to the south of the southern dike of the port of Chioggia. The vertex corresponding to the obtuse angle is located at a point on the north pier of the post of Malamocco, about 300 meters to the east of the beach.

The resulting course runs along near the east coast of the Lido and of Pallestrina, the maximum distance from which is 2½ km. This has the following advantages: It is easy for the pilots to get their bearings; It is possible to act promptly in case of forced descent; The public can watch the entire course of the race; There are wide stretches of calm water at the three vertices of the course which are well suited for the descent of planes on the water.

Each country will have a hangar of its own to cover the seaplanes, as well as a slip of its own.

There will be six seaplanes sent from England, three of which will be entered. Italy will have three planes and the United States one. Lieut. Alford J. Williams has had built by the Kirkham Products Co., Garden City, L. I., a seaplane designed by H. T. Booth, A. C. Thurston and C. B. Kirkham. It is powered with a specially built X type Packard engine which, if the preliminary tests are satisfactory, will be shipped to Venice. Trouble was experienced during the first trials with the pontoons but a new set were built in record time at the Naval Aircraft factory, Philadelphia, Pa.

Owing to the difficulties that Lieut. Williams had with his pontoons and the short time remaining to send the plane to Venice, the National Aeronautic Association sent the following cablegram to the Aero Club of Italy:

"Earnestly urge thirty day postponement date Schneider Cup Race." The Aero Club of Italy sent the following reply: "On account England not having given its consent we are compelled to maintain date Schneider Cup Race."

An additional cablegram was received from the Italian Air Ministry by the National Aeronautic Association giving further explanation of the postponement. It follows:

"The request of the National Aeronautic Association that the race be postponed thirty days would have been accepted favorably by the Italian Air Force, to which American aviation extended exquisite courtesies last year.

"We found it necessary to ask consent of England. England has today communicated to us that this postponement would be in contrast with the rules of the race, which, according to Article 8, established that the date on which the race occurred should be fixed before March 1. England states that she is unable to accept the request made by the National Aeronautical Association, adding that if such a request should be accepted she perhaps would find herself compelled to withdraw from the race.

"His Excellency would like to draw your attention also to the fact that the month of October, according to our experience, is not much suitable for the race from the point of view of the meteorological indications.

"For the aforesaid reasons, the Air Ministry found itself unable to insist that the Aero Club of Italy postpone the race.

"The Air Ministry, however, feels sure that the brave representatives of the glorious American aviation, realizing the inevitable exigencies which compel us to consider the date already fixed for the race, will be able to take their place beside their Italian comrades, who are awaiting them with the greatest enthusiasm with the determination to give them during their stay in Italy more tangible evidence of the friendly relations which unite the Italian wings with those of the great American nation."

Seven high speed planes have been designed and built to the order of the British Air Ministry, and, of these, six are being despatched to Venice. According to British reports they are, three Supermarie-Napier S 5s, two Gloster Napier 4s and one Short-Bristol plane called the "Crusader".

The following information has been obtained through the courtesy of D. Napier & Son, Ltd., and The Supermarine Aviation Works, Ltd.:

This year for the first time in the history of the Schneider Cup Race, the British Machines will be flown by Royal Air Force Pilots.

The "S.5" seaplanes have been designed by R. J. Mitchell, chief engineer of the Supermarine Aviation Works, Ltd. In connection with the design and construction of the machines valuable research work and cooperation was performed by the technical officers of the Air Ministry, The Royal Aircraft Establishment at Farnboro', and The National Physical Laboratory, Teddington, England.

The S.5. is a low wing monoplane twin float type seaplane, and is a development of the Supermarine "S.4" which won the world's speed record for seaplanes in 1925, and still holds the British speed record for both land and seaplanes.

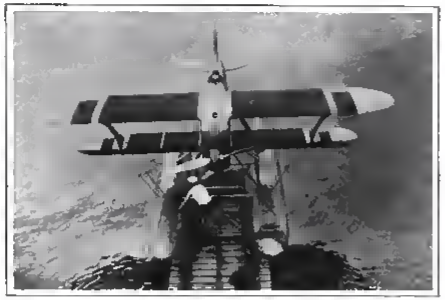
It is worthy of note that the S.4 was the first monoplane float seaplane to be used in the Schneider races since the very early days of flying, and that after the S.4 was produced and performed so well, this type was taken up by the Italians last year and again this year.

All the fuel is carried in the starboard float. The effect of this is to partially balance the engine torque and make the machine more pleasant to fly. The fuel is carried to the engine by means of an engine driven pump. The fuel tank is constructed as a section of the float.

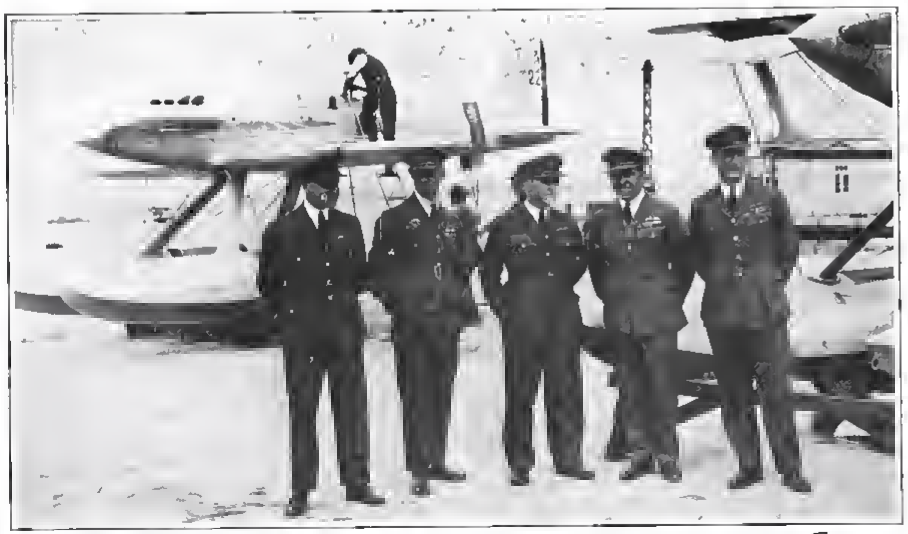
The wing surface radiators are an entirely new development and are a definite advance on anything previously used. They cool the engine without adding any resistance whatsoever to the machine, having a perfectly float outer surface.

The fuselage is constructed entirely in metal, the skin taking practically all the stresses. The engine mounting consists of a cantilevered extension to the fuselage, the skin of the mounting taking all engine loads.

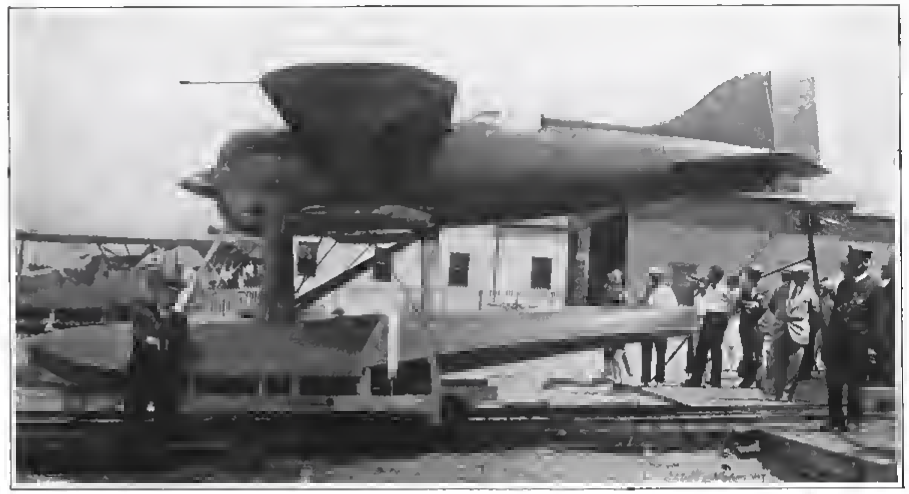
The floats are constructed of duralumin, being anodically treated to resist sea-water corrosion. The wing is built of



(International Newsreel)
Lieutenant Williams' plane on the runway at Caleb Bragg's hangar at Port Washington, L. I.



(Wide World)
The British Schneider cup team. Left to right: Flt. Off. H. M. Schofield, Flt. Lieut. O. E. Worsely, Flt. Lieut. S. M. Webster, Flt. Lieut. S. M. Kinkead and Squad. Leader L. N. Slatter. In the background is a Supermarine-Napier S.5



(International Newsreel)
Lieut. Alford J. Williams standing at the side of his speed seaplane in which he hopes to establish a new speed mark for both land and seaplanes. Lieutenant Williams' plane is powered with a Packard X engine.

One of the Supermarine Napier S 5 high speed racing planes of the British Schneider cup team.

Warming up the "Crusader", a high speed plane designed by Lieut Col W A Bristow It is powered with a Bristol Mercury nine cylinder air cooled radial engine. Photo shows the engine with cylinder cowlings removed

wood and is covered with special laminated wood underneath the radiators Six of the bracing wires at present in the machine are only fitted as an additional safeguard during practice trials and will be removed for speed trials and racing

The oil is cooled by passing it along both sides of the fuselage in contact with the skin through specially constructed oil coolers. The propellers were designed and manufactured by Messrs Fairey Aviation Co, Hayes England

The fuselage is probably smaller in cross sectional area than any fuselage previously designed and the pilots have had to be specially fitted to the machine. The area of maximum section is only just over half that of the S 4

It was found necessary to fit fresh air ducts to clear the cockpit of exhaust fumes and hot air during flight The engine is a special Napier Lion The power has been greatly increased and the engine is developing an extremely high power for its cylinder capacity. The capacity is only about three quarters that of the Italian Fiat racing engine, but the "Lion" is smaller in frontal area

The biplane, the Gloster-Napier 4, was designed and built by the Gloster Aircraft Co, Ltd., of Cheltenham, England

The fuselage is of laminated spruce monocoque construction, while the cantilever tail plane and fins are built integral with the fuselage

Wing radiators of special design are fitted on the top and bottom planes

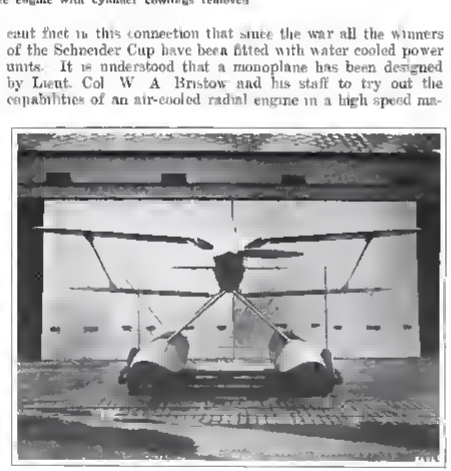
The Napier engine fitted to both the S.5 and Gloster-Napier 4 is twelve cylinder, fan shape, in three blocks of four cylinders each

Considerable improvements and developments have been made in this engine from the ordinary standard service type, and although it is not possible to obtain information about the nature of all the improvements, one outstanding feature is the substantial reduction in the frontal area which makes this engine even more compact than the already small standard Napier Lion.

The power developed is amazing for such a tiny engine, while another big advance is that it has a special reduction gear enabling a slow running air screw to be used which gives a higher efficiency.

Scrupulous care is the hall mark of Napier work, and it is the care and craftsmanship in manufacture, the continual striving after perfection, combined with genius of design, which has enabled this British engineering firm to produce such a fine engine

The Napier Lion is a water cooled engine. It is a significant fact in this connection that since the war all the winners of the Schneider Cup have been fitted with water cooled power units. It is understood that a monoplane has been designed by Lieut. Col W A Bristow and his staff to try out the capabilities of an air-cooled radial engine in a high speed machine. This plane, called the "Crusader", is powered with a Bristol Mercury engine The Bristol Aeroplane Co has built a nine cylinder radial engine with a specially small frontal area and extremely low weight for horsepower



Front view of the Gloster Napier IV Note how head resistance has been reduced to a minimum.

The machines will be piloted by the following Royal Air Force officers Squadron Leader L H Slatter, O B E, D S C, D F C., Flight Lieut. S M Kinkead, D S O, D S C, D F C., Flight Lieut S N Webster, A F C., Flight Lieut. O E Worsley, and Flying Officer H M Schofield

The Italian planes are said to have been built by the Macchi factory and supplied with Fiat engines. Engineer Castoldi who designed the machines which proved so successful last year is the designer of this year's entrant. A special team of about a dozen of Italy's best fliers has been formed under the management of Major Mario de Bernardi, the winner of the Schneider Cup last year, to train as reserve officers for the competition.

Winning Balloon Races With Radio Aid

By WALTER E. BURTON

AN ORDINARY radio receiving set proved of great assistance to Ward T VanOrman and Walter Morton in winning the 1927 National balloon race They floated across three states without seeing an inch of ground, because of dense clouds Yet, thanks to their radio, they knew at all times where they were, and knew their exact position at the instant they landed near Hancock, Maine

This is but one of the instances of the value of radio sets to the racing balloonist During the past few years the receiving set has proved itself so valuable that it is now considered an absolutely necessary piece of equipment. VanOrman has declared that he would rather discard any or all other instruments than give up his radio outfit.

The radio performs a multitude of services for the balloonist It brings to him the latest weather reports making it possible for him to avoid thunder-storms and other violent atmospheric disturbances. It tells him of the progress of other balloons in the race It brings music and voices of friends to break the monotony of long hours of flying Finally, used as a radio compass, it enables the pilot to determine the exact position of the balloon, and to calculate the direction and distance of thunderstorms.

Shortly after the start of the 1927 race VanOrman and Morton learned, through the radio, that two electrical storms were in progress They used their set, a standard Atwater Kent receiver, employing a loop aerial on three stages of radio frequency amplification, to measure the distance to the storm and to find the locations of the disturbances.

Turning the loop aerial until static from each of the storm centers came in loudest, they were able to draw lines on their map from the balloon to the storms Distance was calculated by measuring the time between the lightning flash and the resulting clap of thunder During the daytime, however, the lightning could not be seen. Then the radio was used to detect it As soon as an unusually loud crash was heard, the set was turned off until the same crash reached the balloon in the form of thunder A simple calculation, based upon the velocity of sound through the air, gave the distance With this information, the balloonists were able to take a course between the two storms.

At the 1927 Akron race last minute weather information was conveyed to balloonist on the starting field by the loudspeaker system shown above.

At about eleven o'clock the next morning VanOrman and Morton were flying above a dense blanket of clouds. With the aid of the air sextant and radio compass they calculated that they were above the Adirondack mountains A later descent proved this to be true. Then they threw out ballast and rose to a high altitude They continued across Vermont, New Hampshire and Maine without once seeing ground. Constant check on their position, speed and direction of flight was kept by tuning in, at alternate intervals, two radio broadcasting stations, WCHS at Portland and WEEI at Boston.

Land 50 Yd. From the Beach

At 5 55 o'clock in the afternoon they decided that they were near the Atlantic ocean They quickly descended and landed in a field, not fifty yards from the beach. Had they continued for five minutes longer, they would have come down into the sea This is claimed to be the first recorded balloon flight in which the crew were not forced to determine their position and landing place by asking someone on the ground

A year before, in the 1926 International race from Antwerp, Belgium, radio proved its worth as a navigation aid The flight started and continued in a heavy storm At midnight the two pilots found themselves flying in a dense rain, at an altitude of 15,000 ft and a speed of about 50 m p h The darkness was so dense that they could not see each other The detailed maps of Europe, city maps, list of European lighthouses, and sextants were useless because the rain and darkness cut off every vestige of light from below

The balloon carried a loop operated super heterodyne. It had become partly covered with rain water, but was found to be in working order The balloonists were rewarded by hearing a Berlin station They turned the loop until the signal was loudest and then drew a line on the map in the direction in which it pointed They next tuned in Bremen, Germany with unusual volume Another line drawn on the map indicated that the balloon was near Bremen. To check still further, Madrid, Spain, was tuned in A line from it passed exactly through the intersection of the other two

A sudden downpour of rain a few minutes later brought the balloon to within 300 ft of the ground, and the fliers recognized the city of Bremen They then proceeded with confidence across the Baltic Sea to Sweden and won the contest

Radio First Used in 1923

In the 1923 national race Ralph Upson of Detroit flew the first radio-equipped balloon The success of this test indicated that radio really would prove valuable. Five balloons in the 1924 and 1925 National races carried portable sets, specially designed, but VanOrman's was the only one that worked satisfactorily. In the 1924 and 1925 International races VanOrman was the only contestant to carry radio. In 1926 the total number of sets rose to ten for the National and three for the international races In the 1927 National race fourteen of the fifteen balloons carried receivers

Pioneer balloon-radio experiments were not without danger The design of circuits then in use necessitated the use

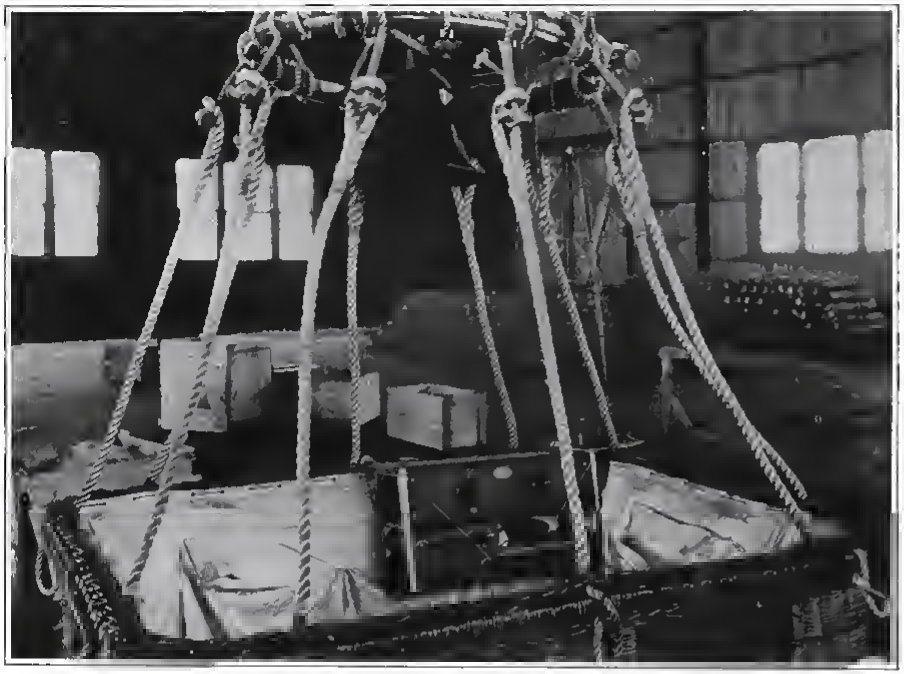


Photo of a U. S. Navy balloon equipped with radio receiving set Note the loudspeaker unit suspended above the basket

of an aerial several hundred feet long and a counterpoise of the same size There was always the chance that the dangling wires would attract a stray bit of lightning, and that the flight would end suddenly with the exploding of several thousand feet of hydrogen gas that the giant bag earned The aerial and counterpoise accordingly were reeled in during electrical storms

Present day radio design permits the use of loop aerials, which are compact and not likely to attract lightning An other advantage is that the directional properties of the loop enable the set to be used as a radio compass

One of the satisfactory radio outfits weighs 37 lb complete. Batteries, which weigh 12 lb., are thrown away before the end of the flight, and accordingly may be considered as ballast The effective weight, therefore, is 25 lb.

Useful meteorological information has been obtained by balloonists using radio receivers As soon as the craft leaves the ground there is an immediate change in reception Greater volume can be obtained and greater distance covered. As the balloon goes higher it passes through places in the atmosphere where air friction is creating static. Accordingly, the static volume increases at these points On the whole, however, the atmospheric disturbance decreases as elevation is gained

A thunderstorm in the making can be detected by the radio hours before the first visible flash of lightning occurs. Friction caused by two or more currents of air moving in different directions or at different speeds, or by the mixing of air at different temperatures generates the static which later centers about a thunder head

Radio has proved to be the connecting link between balloons and the ground At 15,000 ft in the air a balloon crew feels completely detached from all earthly things. There is no noise, no perceptible motion, and little excitement. A feeling of utter loneliness often develops It is here that the radio set proves its worth in another manner It brings music to break the monotony and buoy up the spirits of the fliers, and it brings the voices of friends to give them renewed confidence.

Within the next two or three years racing balloons will carry small, compact broadcasting sets, according to VanOrman Experiments now being conducted indicate that a satisfactory unit can be developed The best wave length seems to be 40 meters or less. With a power of five watts virtually every point in the United States could be reached from a balloon at a fairly high elevation.

Greater safety for balloonists will be perhaps the most valuable result of the using of sending equipment. The balloon crew can send out information concerning the position of the craft, or warn the outside world of any danger that may threaten the bag If forced landing is made in an uninhabited section, such as parts of Canada, much lost effort of searching parties will be avoided.

Ground to Plane Radio Tests Successful

The Bureau of Standards of the Department of Commerce has made several radio test flights in cooperation with the Post Office Department, using Post Office airplane 630 at Bellefonte, Pa. This airplane was placed on the regular air mail run between Cleveland and New Brunswick N. J., equipped for radio telephone communication with a range of approximately 100 mi from Bellefonte On tests under favorable conditions conversation was maintained for 150 mi from the ground station The Bellefonte radio station broadcasts weather and other information to this airplane.

This station is located about 4½ mi from the Bellefonte field and is remotely controlled from the hangar office, enabling the personnel there to broadcast information without interfering with radio reception at that point

Los Angeles to Tokio Non-Stop Flight

All misunderstandings regarding the Sid Grauman offer of $30,000 for the first non-stop airplane flight between Los Angeles, Calif., and Tokio, Japan, were cleared when the proposed contest was placed under the auspices of the Los Angeles Chamber of Commerce Mr Grauman is a Hollywood theatrical impressario and has extended the time limit of his offer to two years dating from July 1, 1927 Because he was anxious to stimulate immediate activity, Mr. Grauman at first limited his offer to one year only, while the more conservative element held out for a three year period. The matter was settled by compromising on the two year limit.

Weather conditions over the Pacific permit of only four months during the year favorable to the flight, June, July, August and September. Early in October the typhoons set in, it is said.

Working in conjunction with H R Brashear, head of the Chamber of Commerce Air Transportation Committee, and one of Southern California's most active workers in the interest of aviation, Mr. Grauman formulated the following rules to govern contestants for the prize.

1. The flight shall be made either from Los Angeles to Tokio or from Tokio to Los Angeles.

2. If made with a land airplane, point of departure and point of arrival shall be within a radius of 50 mi. of Tokio or 50 mi. of Los Angeles. If the flight be made in a seaplane, point of departure and point of arrival shall be within the three mile limit in costal waters within 50 mi. of Tokio or 50 mi of Los Angeles.

3. The flight shall be a non-stop flight between these two points without refueling.

4. The flight shall be known as "Sid Grauman's Non-Stop Los Angeles-Tokio Flight".

5. Competition shall be open to aviators or airplanes of any nation of the world having affiliations with the Federation Aeronautique Internationale.

6. All contestants and airplanes flying from the Los Angeles district as defined in rule 2., must qualify under the air regulations of the Aeronautic Branch of the United States Department of Commerce

7. Each contestant must properly fill out an entry form which will be furnished upon application and the form must be filed with the Los Angeles Chamber of Commerce accompanied by a certified check for $200 as an entrance fee to be made out to the Contest Committee of the National Aeronautic Association, Los Angeles, Calif., and notice thereof sent immediately to the trustees of the Sid Grauman prize.

The application must be filed not less than 30 days before the flight is started.

To Discuss Aviation at Babson Conference

The Babson Statistical Organization, Babson Park, Mass., which has for some time been interested in air transportation, and realizes the importance of general business getting behind the project of stimulating interest in flying, has set aside the entire afternoon (Sept. 13) of the Fourteenth Annual National Business Conference, to be devoted to discussion of "Air Transportation".

Four very able men have consented to speak. They are as follows: Hon Wm P MacCracken, assistant secretary of commerce for aeronautics, Maj. Gen John F O'Ryan, president, Colonial Air Transport Corp., Paul Henderson, general manager, National Air Transport Corp., and C Francis Jenkins, Washington, D C

In addition to the speakers, Samuel Perkins of Massachusetts, long identified with kite-flying activities, will fly several kites among them being ones identical to those carried by Comdr. Richard E Byrd on his flight to France

A very interesting afternoon is promised and the Babson Statistical Organization invites everyone interested in aviation to attend the Aviation Afternoon on Tuesday, Sept 13 at 1.45 Transportation has been arranged from the Wellesley Hills station, which is 15 mi. from Boston.

Russian Wins Round-the-World Trip

In May, the drawings of the prizes for the First Federation Air Fleet lottery, organized by Aviachim, took place in Moscow. The first prize was won by M. Kasarinoff; this prize consisted of a trip around the world, and we hear from the Deruluft, the German-Russian air line that M. Kasarinoff started from Moscow on July 17th, and is now on his way circling the globe. The world trip has been organized by the Deruluft with the cooperation of the Hapag and Deutsche Luft Hansa M. Kasarinoff started from Moscow in a Deruluft plane, and after a two day stay in Berlin proceeded to Paris and Boulogne He then took a steamer for New York and remained there for two days and then continued on his trip across the United States to San Francisco Ha will take

Mr Kasarinoff (left) arriving in Berlin.

a North German Lloyd steamer to Tokio and from there a Russian steamer to Vladivostok The Aviachim will furnish him airplane transportation for the 9,930 kilometer trip from Vladivostok to Moscow.

According to the Aviachim this was the first lottery of its kind. There were 2,000,000 chances, the prizes aggregating 1,000,000 rubles in value or about $500,000. The price of each ticket was 50 kopeks. The first prize was to be the trip around the world taking two months In case laborers or other wage earners won the prize they were to receive full wages during the period of the trip from the Aviachim Two other trips were offered as prizes, one a twenty-day trip through Europe from Moscow, Hamburg-Cologne-Paris-Marseilles-Nice-Rome-Venice-Vienna-Prague-Dresden-Berlin-Moscow, and a 27 day journey via Constantinople and Athens. In addition to the above there were six other special trips including sightseeing trips from Moscow and other cities. There were to be a total of 7,800 trips Winners of the trips were given the choice of taking the value of the trips in money if they could not make the journey.

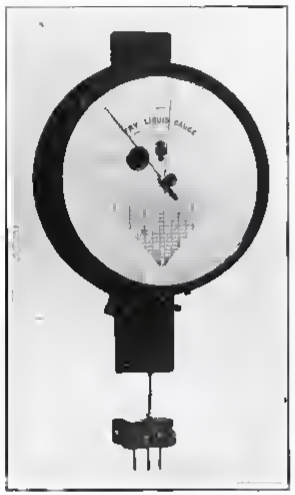
A.S.P.A. Fosters Radio Lectures

In conjunction with The American Society for Promotion of Aviation, Station WGL, Hotel Majestic, New York City, is conducting a series of aviation talks which began August 25 Well known aviators are to give educational talks covering all phases of aviation. An interesting feature now being worked out will be flying instruction given by an ex Army air service instructor whereby the listener will be told the exact working of the controls and the conditions to be met with in actual flying.

Aircraft Trade Notes

The Fry Liquid Gauge

The Equipment Corp, successor to the Guarantee Liquid Measure Co, Rochester, Pa, has recently announced a new and ingenious liquid gauge which will be of great value to operators of fuel service stations. It is realized that the popular method of measuring gasoline with a gauge stick is entirely inadequate, and only relatively accurate, while the fire hazard in this method is very great. It is stated that the "Fry Liquid Gauge" determines accurately the amount of liquid put into a tank, the amount taken out, and will show at any moment the amount of liquid in the tank. It is a simple, durable instrument of convenient size.



The Fry Liquid Gauge

The distance between the gauge and the tank from which readings are desired is immaterial. The only connection between the dial and the tank is a small copper tube which connects the dial with a tank tube inserted into the fill pipe of the storage tank.

A hand moves clockwise across the face of a dial which indicates the liquid level in the tank. The hand points to figures designating the height of the liquid level in the tank, expressed in tenths of inches. A chart in accordance with the dimensions of the tank, translates the inches of liquid level into gallons.

When a reading is desired the operator injects air into the tube by a small pump provided in the instrument. This expels the liquid from that portion of the tube in the tank and the entire system is filled with air. This compressed air is connected to a mercury column which in turn moves the hand across the face of the dial until it shows the exact depth in inches of the tank.

This gauge can be connected with one, two, three, or four tanks and the contents of each individual tank determined by separate readings.

N.A.C.A. Report on Drag of End Plates

The National Advisory Committee for Aeronautics has recently published Report No. 267 entitled Drag of Wings with End Plates by Paul E. Hemke.

In this report a formula for calculating the induced drag of multiplanes with end plates is derived. The frictional drag of the end plates is also calculated approximately. It is shown that the reduction of the induced drag, when end plates are used, is sufficiently large to increase the efficiency of the wing.

Curves showing the reduction of drag for monoplanes and biplanes are constructed, the influence of gap-chord ratio, aspect ratio, and height of end plate are determined for typical cases. The method of obtaining the reduction of drag for a multiplane is described.

Comparisons are made of calculated and experimental results obtained in wind tunnel tests with airfoils of various aspect ratios and end plates of various sizes.

Report No. 267 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

Vought Planes Delivered to Peruvian Navy

With the recent delivery of Vought Naval Seaplanes to the Government of Peru, another South American country is added to the list of those using the products of this widely known American manufacturer.

These planes are for the use of the Peruvian Navy, and are of the standard Vought UO type, with provisions for usual armament and radio equipment for observation work. They are finished in yellow enamel with black trim, thus making the planes easily visible. This color scheme, with the Peruvian insignia on the wings and tail, makes an effective and pleasing combination.

Standard Vought Navy float-type landing gear has been supplied with these planes, though the planes are convertible to landplanes by the quick interchange of wheel-type gear for the floats. This water gear consists of a single main float and two wing tip floats, and duplicates that which has given such excellent service on Vought planes throughout the U. S. Naval Air Service under difficult operating conditions, including catapulting from battleships and scout cruisers.

The purchase of these Vought planes by the Republic of Peru is the first step in the modernization of the naval and army Air Services of that country.

The aeronautical activities of the government are under the able direction of Comdr. H. B. Grow, who is rapidly assembling the personnel and material authorized by the Peruvian congress to enlarge and modernize the air services.

N.A.C.A. Report on Jet Wind Tunnel Cones

The National Advisory Committee for Aeronautics has issued Technical Notes No. 260 on the study of open jet wind tunnel cones, by Fred E. Weick. Tests were made by the Committee on the air flown in an open jet wind tunnel with various sizes, shapes, and spacings of cones, and the flow studied by means of velocity and direction surveys in conjuction with flow pictures. It was found that for all combinations of cones tested the flow is essentially the same, consisting of an inner core of decreasing diameter having uniform velocity and direction, and a boundary layer of more or less turbulent air increasing in thickness with length of jet. The energy ratio of the tunnel was obtained for the different combinations of cones, and the spilling around the exit cone causing undesirable air currents in the experiment chamber was noted. An empirical formula is given for the design of cones having no appreciable spilling.

Copies of this paper may be obtained from the National Advisory Committee for Aeronautics, Washington, D. C.

Stout Service Inaugurates Short Tours

The Stout Air Services, Inc., of Detroit, Mich., because of a popular demand for short air trips over the city, have inaugurated what they style aerial tours. During the month of June, 2,000 passengers were carried in this way.

FOREIGN AERONAUTICAL NEWS NOTES

By Special Arrangement with the Automotive and Transportation Divisions, Bureau of Foreign and Domestic Commerce

Italy Plans Air Expansion

Italy is seeking to extend its commercial air operations to Berlin and other European centers. At present there are four lines: Brindisi-Athens-Constantinople; Rome-Venice-Vienna; Genoa-Palermo; and Turin-Trieste. These lines are operated by four different companies under special state concessions. To stimulate greater popular interest in commercial aviation, there has been created the Instituto Nationale de Popaga Aeronautica with headquarters at Rome.

Medals Awarded to de Pinedo and Cobham

The International Federation Aeronautique has awarded the gold medal for the greatest air achievement of 1925 to Comdr. Francesco de Pinedo. His Rome-Tokio flight was the basis of the award.

Sir Alan Cobham, the British flier, received the 1926 medal for his London-Melbourne and return flight.

The flights of Col. Charles A. Lindbergh, Comdr. Richard E. Byrd and Lieuts. Maitland and Hegenberger were mentioned as notable achievements of 1927.

Air Corps Asked to Organize Cuban Air School

The War Department has been notified by the State Department of a communication received from the Charge d'Affaires ad interim of Cuba expressing the desire of the Cuban Government to obtain the services of three United States Army Air Corps officers for the purpose of organizing an aviation school in the Cuban Army. While the War Department looks with favor upon this proposal, before proceeding further it has requested the Cuban Government to make a definite proposition covering the conditions upon which that Government desires the services of this personnel. Subject to the arrangement of necessary details, the War Department will make available the services of Army Air Corps personnel as requested by the Cuban Government.

Air Patrol of Fisheries

A patrol of the British Columbia fisheries by airplanes has been authorized by the Dominion Government in an effort to prevent illegal fishing during closed seasons and in closed areas. The patrol will extend from the international boundary to the Queen Charlotte and Prince Rupert district.

Madagascar Air Mail

The first air mail transport in Madagascar has been performed successfully by Commandant Dagnaux in an Army plane. The operation was an experiment to enable the people of Tananarive and vicinity to mail letters which would catch the mail steamer for France at Majunga, some four days after the closing of the regular mail despatch from Tananarive post office. The trip was an excellent example of the ease with which such an air mail service could be maintained, gaining nearly a week of time over the usual routing via the port of Tamatave and the railway, which requires a 15 hour railway trip. A seaplane would, however, be preferable for this service, as it would eliminate the necessity of using a landing field 20 mi. from Tananarive. There is a small lake only 2 or 3 mi. from the capital that can be used as a seaplane landing ground. Regular air mail service between Tananarive and Majunga may, in time become a reality.

Mexico City-Nuevo Laredo Air Mail

Arrangements for the transportation of mail by air between Mexico City and Nuevo Laredo have been approved by the director of the postal service.

Airplanes Used for Spraying in Canada

Airplanes will be used for chemical spraying in Manitoba over wheat fields, in an effort to prevent rust. The machine will cover about 6,000 acres a day, flying at a height of 60 ft. It will carry 700 lb. of chemical in the spraying apparatus.

Bids for Hangar Construction in Buenos Aires

Bids for the construction of seven warehouses and eleven airplane hangars at Buenos Aires were recently received by the minister of public works. It is reported that work will commence shortly, as the government desires to open this section of the new port as soon as possible.

French Organization to Study Air Enterprises

An organization has been created in France to study air enterprises in all countries but particularly France, the Mediterranean and the Far East, and especially to establish a line from France to Syria, crossing Greece. It has been designated "Compagnie Air Union Lignes d'Orient".

Newspaper Special Now Makes Round Trips

In addition to the Newspaper Special, which now operates daily between Croydon and Ostend, and enables visitors in Belgium to find their London newspapers on the breakfast table, there is a new return service from Ostend to London, which will be operated daily. The passengers leave the offices of Imperial Airways, 23 Rue St. Petersburg, at 8:30 A.M., and arrive at Airways House, London at 11:40 A.M. In view of the great saving of time and its simplicity, this service should prove a very popular one.

Spanish Aviation

An interesting report on the development of aviation in Spain has just been made public in the European press. This development is credited to General Echague, head of military aviation in Spain. The proceeds of a loan of 160,000,000 pesetas is being devoted to aviation construction. One half of this sum is being used for the building of a marine air fleet and as a result, the Spanish Army is credited with 700 airplanes, 400 reserve engines, and 300 airplanes in the course of construction. The program of the Spanish Military Authority is, according to this report, to have 900 Spanish built engines by the end of 1928, of which 350 will be water-cooled.

The principal airplane factory is at Cuatro Vientos, which is credited with an output of 18 planes a month, to be increased to 35 a month. This factory also produces 25 engines a month, to be increased to 40. In Seville there is a production of 8 planes and 8 engines a month.

According to Colonel Riendelen, chief of Air Service in the Spanish War Department, the total capacity of airplane plants in that country is 900 airplanes and 1200 engines a year.

Airport for the Canary Islands

The construction of an airport in the Canary Islands has been approved by the Government, but no location has been selected. The best possible landing grounds and ports are in Gando, Grand Canary, and Ahona, Teneriffe. The two islands and the economic societies in each island are urging the Government to establish the airport in their respective ports. The Government has replied to the effect that conditions in each port will be seriously studied before definite action is taken. The establishment of an airport in the islands will increase their importance and would be of great use in future flights between Europe and South America.

Foreign Aeronautical News

(Continued)

Aviation in Bulgaria

Civil aviation in Bulgaria has developed only in a limited way and military aviation is prohibited by the Treaty of Neuilly. The Bulgarian Government has decided to maintain a "State aviation", with machines theoretically attached to the air postal services and under the supervision of the minister of railways, telephones and telegraphs. Some aircraft has been purchased in France and England, but no regular postal air service has been provided. Increased appropriations since 1922 have made possible the purchase of improved aircraft. Several biplanes have been constructed under the State aviation authorities.

Three contracts have been made recently with a view to advancing aviation in Bulgaria. The First Bulgarian Aviation Society has secured an exclusive right to operate on the following lines and a promise to be given consideration in the case of other lines: Vidin-Rousse-Varna (connecting with the European Vienna-Budapest-Rousse-Constantinople line), and the Sofia-Rousse-Varna line (connecting with the European Budapest-Rousse-Salonika-Sofia-Burgas line).

The company will not receive financial assistance on its contract, which covers a period of 10 years, but will receive postal moneys collected for the transportation of letters, parcel post, and passengers. The Government has authorized free use of hangars and other facilities and a loan of 10,000,000 leva, without interest, to be repaid after two years of operation.

The first service will be on the line Sofia-Rousse-Varna, and airplanes are being procured for use there. The company must keep at least one-third of its planes within Bulgaria at all times.

An agreement for the exclusive construction of airplanes in Bulgaria was made with a Czechoslovak company, the "Aero Prague", to run 25 years. The Government will give necessary ground for the plant near Kazanluk, and will purchase half of the machines it will need from the company at cost price, plus all general expenses, plus 15 per cent. The other half of the Government's necessary planes will be bought from abroad or from its own workshops.

The third contract was made with the 'Compagnie International de Navigation Aérienne", of France, which has been operating a Paris-Belgrade-Bucharest-Constantinople service. The company secured a concession for a new line, Dragoman-Sofia-Svilengrade to be operated during three years. This company also must keep within Bulgaria one-third of the airplanes used, and must employ Bulgarians up to one-third of its personnel requirements. It will receive two-thirds of the receipts obtained from carrying air mail.

A great deal remains to be done in the matter of providing auxiliary services, such as meteorological stations, emergency landing fields, telephones, wireless stations, and the marking of air routes, etc.

Aerodrome Hotel at Croydon

The foundations have now been laid of the new Aerodrome Hotel, which is part of the £250,000 Croydon aerodrome reconstruction scheme. This hotel, which will be worthy of the best traditions of British civil aviation, will have lounges and dining rooms opening on to a veranda and terrace commanding an uninterrupted view of the flying ground, from which the air expresses will depart. There will be fifty bedrooms many with bathrooms, for the accommodation of air travellers arriving late at night, or leaving by early morning services. It is expected that the new hotel will be completed by next Easter.

Pigeons Carried from Croydon to Paris

Recently 1,600 pigeons had a curious experience when in an Imperial Airways Air Liner, fitted up as a pigeon loft, they left Croydon on a 2½ hours flight to Paris en route to Marennes on the Bay of Biscay, from whence they were destined to take part in a race back to Burton.

AIRPORTS AND AIRWAYS

Oakland, Cal.

By D R. Lane

Oakland municipal airport, starting point of the Dole flight, is the newest, the largest and, when present contracts are completed, will be the most completely equipped of all non-military fields in the west. Its chief assets are its great area, 825 acres, its absolute freedom from obstructions and its weather conditions. These are said to be better than those at most fields on the Pacific coast.

The port is a recent creation. The first payment for the original 680 acre tract of land was made on Feb 14. Improvement was slow at first, the Board of Port Commissioners of Oakland, the body which owns and is developing the port, devoting considerable time to study before doing any actual work.

The visit of F. Trubee Davison, Assistant Secretary of War for Aviation, to Oakland last May resulted in an immediate stimulus to the development. Secretary Davison promising the port commission that, if the new field was in proper condition for a take-off by June 25, the Army's flight to the Hawaiian Islands should start from the Oakland airport. As the Army had not then announced it planned a flight to Hawaii, this arrangement was not revealed for some weeks, until, in fact, the flight had been completed.

However, the commission had plans drawn, extending the projected initial development from a field 2,500 by 3,000 ft. to include a runway almost as long as the land then owned would permit. That is, 7,020 ft. long, directly into the prevailing wind. Workmen were put to clearing this, levelling it and rolling it. Two days before the set date, the runway had been put in perfect order. It was duly used by the Army, later used by Ernest Smith, and considerably enlarged by the Dole fliers.

At present the graded and rolled area available for commercial planes is 1,800 by 2,500 ft. plus the runway. This is 600 ft. wide at its upper, or starting end and half that width at the lower end. The two together are considered an ample four-way take off area for any planes that may ever come to the Pacific coast. Projected developments will make a four-way field of the port for its entire area.

At present, the port consists of 825 acres. By coincidence, the final deed for the first 680 acre block was filed on the day the Dole fliers took off. The field is 7,215 ft. in length from east to west and 8,330 ft. from north to south. A part of this is tideland which is still submerged, but will be filled by dredging from harbor channels the port commission wishes to deepen. The marine and aerial development of Oakland as a port will thus go forward together.

Plans call for the purchase of about 600 additional acres, making the entire port 1,425 acres. Part of this area is to be used as sites for aviation industries.

Contracts now let provide for the erection of two steel and concrete hangars, each 90 ft. by 200 ft.; an administration building, 42 by 60 ft.; a shop building, gasoline and oil handling facilities, a lighting system and a large amount of drainage. This is necessary because the elevation of the Oakland municipal field is occasionally reached by high spring tides

in San Francisco bay. The field is protected from these tides, however, by a system of dikes, the drainage is necessary to care for the runoff from winter rains which will not drain into the ocean on account of the low elevation.

The lighting system will be modern and complete, with beacon, floodlights, markers, obstruction lights and runway markers.

The buildings now under contract will be placed at the north side of the field, in the area expected to be used eventually for industrial sites. Planned development, when all the tidelands have been filled, provides for rows of hangars along the easterly edge of the field. This, however, is tentative as yet.

Wichita, Kan.

By Zach Taylor

In its new factory at the Wichita airport, Travel Air is a picture of the aircraft industry of Wichita coming into its own in modern methods of mass production and almost militant efficiency. Well made planes run into the assembly room almost daily, and in a short time are buzzing over the airport in test runs under the direction of Clarence Clark, test pilot, or Walter Beech, president. It was these two who supervised the tests for the monoplanes of Arthur C Goebel of Hollywood and Bennett Griffin, in tuning up for the Pacific flight.

J. L. O'Donnell of Los Angeles has purchased a J-5 Travel Air biplane for the expressed intent of entering the national derby. Nick Mamer, Swallow dealer at Spokane, is buying a Swallow J-5 powered for the same purpose, and Clyde V. Cessna announced that if his entry was acceptable the first plane of the Cessna Aircraft Company, newly-organized, would be piloted by George Myers, and a second would be built for Romer G. Weyant, commercial seaplane pilot of Buckeye Lake, O.

Fully a half-dozen planes are being released here weekly. Travel Air has completed its contract for eight monoplanes of the transport type for National Air Transport, Inc. The recently organized Mississippi Airways, the concern that plans a passenger and express line between Memphis and New Orleans, has ordered two monoplanes for that route, also a biplane.

Indications are that the mail run between Kansas City and Dallas will be haunted by the Travel Air monoplanes after Sept 1, following the announcement of Col Paul Henderson, general manager, of the establishment of a regular passenger schedule over the route on that date. Quite often the monoplanes appear over the route, as the passenger business begins to increase, according to George Comstock, airport manager.

N. A. T. also is progressing rapidly with the installation of lights on the government airway. One light and emergency field has been completed, and equipment has been "spotted" at several locations. A night mail service is likely with the completion of this project.

Prairie Du Sac, Wis.

Prairie Du Sac obtained its first air field when Ed Accola arrived recently from Dayton, Ohio, with his Waco plane which he purchased there. A hangar has been built on a landing field just west of town, and Mr. Accola is now busy taking up passengers.

Kansas City, Mo.

By R. S. Knowlson

Kansas City's new airport, which was recently dedicated, is almost in the shadow of the Kansas City post office and within a ten minute trip by motor car to any part of the downtown district. Admittedly it is one of the most accessible flying fields to a city it is designed to serve, in the World.

The Kansas City airport lies just north of the city being separated from it only by the Missouri River. The field as it now is constituted, consists of a runway running gener-

ally north and south and another which crosses the north-south runway at right angles.

Each of the two runways is 3,000 by 300 ft The plan of the runways, however, is more or less a temporary matter since it is the idea of the city to ultimately grade the entire field of more than 680 acres so that all of it will be available for landing purposes It is planned to construct dikes on two sides of the field to obviate the possibility of high waters in the Missouri River flooding the airport.

The soil of which the field is composed is extremely sandy, which tends to absorb any moisture on the ground in a short time. The runways already have been planted with cow peas, which, because of their very rapid growth, will aid in acting as a binder until grass can be planted.

The only building on the field at present is the new air mail hangar, a steel structure slightly larger than the old air mail hangar which burned down at Richards Field early this year It is planned to shortly move the Army hangar from the old field to the new airport and then to do likewise with the commercial hangar. In addition to those buildings, the city will construct another hangar for the new field

An ordinance to approve a lease made with a development company by the city was passed before work was commenced on the field. The lease is for three years and with it the city holds an option by virtue of which the ground may be purchased at any time within the 3-year period.

The city manager, Mr. McElroy, has announced his intention of submitting a bond issue in October of $1,000,000 for the purchase of the tract the first year The difference between the purchase price and the amount of the bond issue, Mr. McElroy has said, would go toward additional improvements at the new airport.

Houston, Tex.

Houston is constructing an airport on private land leased to the city. The site selected is eight miles from Houston and about twenty minutes auto ride from the main Post Office. It has an area of 2,700 sq. ft., clear approaches, and the total area is available for non-hazardous landings Experts declare it will have every qualification for a Department of Commerce triple A rating

The city will furnish all facilities, including free hangar space and courtesies to planes of the Air Mail Service, Army and Navy.

Denver, Colo.

Occasionally a pilot flies under peculiar circumstances Justin A McInaney, Sales Manager of the Alexander Aircraft Company, recently was called upon to fly a doctor from the city of Denver to Laramie, Wyo

Gerald Smith is at the Alexander Aircraft Company factories to take delivery on an Eaglerock plane which has been named the "City of Tacoma".

This plane, purchased by the Tacoma theatre operators, has been entered in the National Air Derby race from New York to Spokane, Sept. 19 to 21

Guernsey, Wyo.

By J. O. Lawhead

The Guernsey Chamber of Commerce with the assistance of the Boy Scouts is equipping a landing field about a half mile from town The field will be a four way field, well marked and equipped with refueling facilities. The field will be dedicated to F C Ulman and will be known as the Ulman Field All pilots will be welcomed here and will be given courteous attention and assistance

Los Angeles, Calif.

By Charles F McReynolds

The tri-engined Ford monoplane, purchased by Jack Maddux, is being flown from the Rogers Airport until Mr Maddux obtains further deliveries of Ford all metal monoplanes, at which time he has announced his intention of opening a passenger service over the San Francisco Los Angeles-Dallas Airway In the meantime the big plane is making regular excursion flights over Southern California and is attracting

such crowds to Rogers Airport that at least two Travel Air biplanes are in the air all of the time carrying passengers on sight seeing rides over the city.

Right on the heels of the Ford plane came Jack Frye, of the Aero Corporation of California, with his new five place Universal Fokker monoplane, equipped with self starter and wheel brakes. The Aero Corp has graded and oiled the entire field in order to handle the new plane and the great volume of traffic which it has attracted.

Major C. C Mosely, of Western Air Express, and Bill Henry, local newspaper man, dropped in last week after a twelve thousand mile tour of the country in sixteen days. All important eastern factories and operating airlines were inspected and it has been stated that W.A.E. is soon to branch out with a multi-engined cabin plane passenger airline serving the Pacific Coast from Canada to Mexico and possibly as far as Mexico City.

B. W. Bourne has opened a new field next to the Burdette Airport. He is a sub-agent for the Alexander Eaglerock and is building hangars and grading his field at the present time.

Burdette Fuller has constructed four new hangars at his field on the opposite side from his former row of hangars, has graded and oiled the entire field and repainted all hangars so that the field presents a most attractive appearance at present.

R. M. Kinner hopped from the Kinner Airport, Glendale, Calif., for Boston, Mass., recently with the first of six Kinner Airster biplanes consigned to E. C. Dennison of Boston.

Tulsa, Okla.

By Fred L. Foster

The McIntyre Airport at Tulsa is one of the extremely active airports of the southwest.

To take care of the increased demand for plane storage and service, six new, modern steel hangars are now in course of erection at the field. This addition will make this port one of the largest, from a building standpoint, anywhere in the middle west.

Modern machine shops are being installed in the large hangar at the west side of the field, making possible the overhaul and rebuilding of any type of plane. A corps of expert mechanics is maintained at the field and has built up a splendid reputation for the highest type of airplane service.

Three powerful floodlights have been installed on the field and night flying has become popular with those who enjoy night rides over the city and surrounding country. The installation of lights has also resulted in increasing the popularity of the airport as now many fliers on long trips can come to Tulsa after dark, being assured of a well lighted field regardless of the hour of arrival.

The training school for pilots, maintained at the McIntyre Airport, under the direction of W. M. Collier, reports the largest class in training since the school was opened several years ago. Thirty-one students are enrolled in the present class and there is at present a waiting list.

D. A. McIntyre, proprietor of the airport, reports the sale of Waco planes to a number of business men in Tulsa, several of which have already been delivered and others waiting their turn at the factory.

Every day some new use for the airplane in the oil industry is found and each demonstration of its time-saving efficiency is having its part in rapidly popularizing the airplane as a regular transportation medium.

When the Mazda Oil Corporation scratched the sand in their "wildcat" near San Angelo, Tex., they were compelled to abut the well down to await a special type of packer. Every hour of shut-down was very costly. When the president, Julius Livingston, arrived from Tulsa he quickly sized up the situation, stepped to the telephone and called the packer manufacturers in Tulsa, telling them exactly what type of packer was required. They advised it would be ready for shipment next morning.

Railroad transportation meant several days of valuable time lost in bringing in the well. Mr. Livingston called the McIntyre Airport, told them the packer would be ready early next morning and asked if they could bring it to the well, 500 mi. distant, by airplane. He was told this would be easy and at eight o'clock the 600 lb. packer was in the plane and on the way. It was delivered at the well at 1:30 the same afternoon.

In no other industry does time count so much as in oil and the oil men are daily coming closer to the universal use of air transport for the handling of quick passenger trips, official papers, inter-office mail, repair parts, etc.

Bartlesville, Okla.

By P. H. Dixon

An international air meet in Bartlesville, Okla., with cash prizes totalling $25,000 is being planned by Frank Phillips, millionaire oil man of Bartlesville.

The meet will be held in October, the exact date to be announced later. Cups and other trophies also will be awarded at the air meet, it was announced.

Mr. Phillips was financial backer of Art Goebel and the "Woolaroc", the winner of the Dole prize for the non-stop flight to Hawaii. Goebel is to assist him in staging the air meet, Mr. Phillips said. Mr. Phillips will personally give the $25,000 for prizes at the air meet, it is announced.

The Phillips Petroleum Company has established a practical landing field at Bartlesville and is experimenting on aviation fuel with a Travel Air monoplane, fitted with a Wright Whirlwind engine.

Geneva, N. Y.

By E. E. Saelgrove

The fleet of planes at the Finger Lakes Airport of Geneva, N. Y., has been reduced to four with the sale of a Hisso-Standard to Ralph Haynes of Williamsport, Pa. Haynes will use the Hisso in barnstorming work. He left Geneva recently with his newly-acquired plane. Spencer Punnett, in charge of the field, expects to take delivery on a new OX-5 Eaglerock sometime within the next two or three weeks thereby bringing the complement of planes to five. At the present time the planes used in transporting passengers, aerial photography and other services flying from the Geneva field are as follows: OX-5 Eaglerock, OX-5 Standard and a Jenny. There is also a privately owned OX-5 Eaglerock at the field. Harold A. Nester, the owner of this plane, is at present using the plane for a vacation trip in the Thousand Island region.

Herbert Fink, the first student of the airport, recently soloed using the OX-5 Standard for his initial flight.

W. A. Brooks and Walter R. Jones, inspectors of the Aeronautics Branch, U. S. Dept. of Commerce, inspected the aircraft and equipment of the port on Aug. 23 and 24. All planes were given the official O. K.; Spencer Punnett and Charles L. Wethern successfully passed their tests for transport pilot's licenses.

Ralph Haynes, purchaser of the Hisso-Standard from the local field dropped in for a short visit accompanied by Mr. Dodson. Mr. Haynes is working the vicinity of Elmira, N. Y., for a short time previous to returning to his headquarters in Williamsport, Pa.

Philedelphia, Pa.

By Edwin L. Bowker

The Federal Government will continue its aeronautical course at Temple University, this city, again the coming academic year. This announcement was made by Lieut. Comdr. Robert S. Hedtler, aeronautical engineer at the Naval Aircraft Factory, Philadelphia Navy Yard.

Commander Hedtler declared that the Government was gratified by the results of the aviation instruction given free at the University last year under the auspices of the Navy Department and has approved of its continuance.

In conducting this aviation course at Temple University for 1927-28, Commander Hedtler will be assisted by regular Naval and Naval Reserve officers attached to Squadron V.T. 30 at the Philadelphia Aircraft Factory. The course starts Oct. 1 and will continue until May 10.

Completion of the course qualifies a limited number of young men for commissions as ensigns in the Naval Reserve.

with designation as Naval Aviators. The course is open to applicants between the ages of 18 and 27 who are either college students or college graduates. It is a preliminary aviation ground school course in which theoretical aviation subjects are taught.

An advanced course in flight training is conducted after graduation at the Naval Air Station, Hampton Roads, Va.

In preparation for opening the new air mail line from Philadelphia to Atlanta, the Pitcairn Aviation Company, of Philadelphia, recently inaugurated a test flight which was very successful.

James G. Ray, the operations manager for the company, flew from the Pitcairn Flying Field at Hallowell, Pa., near Philadelphia to Atlanta. His flying time going south was 6¼ hr. The return flight to Philadelphia was made in 6½ hr. Three days were taken for the round trip test journey.

The new air mail line will be formally opened Nov. 1. It will be a night service from 9 P.M. to 6 A.M. The Pitcairn company is now awaiting the installation of airway beacons and all will then be ready for the service.

Winthrop O. Sargeant, of the Aeronautics Bureau of the United States Department of Commerce, recently inspected the Hallowell flying field and all the planes there. He reported everything in excellent condition. Mr. Sargeant also successfully tested twelve pilots on ground and flying work. All of which goes to prove the first class training given aviation students at the Pitcairn field.

There are now sixty students at the Hallowell Aviation School, including one woman. Ten planes are being used in the training. Benjamin Faulkner is in charge of the field.

Portland, Ore.

By Wm. C. Brubaker

Swan Island, Portland's modern aviation field, will be 6,600 by 1,600 ft., with unobstructed approaches over water in all directions. The surface is level and smooth and the sod of wire grass will soon be firm enough to land on.

The field will be under the supervision of the Port of Portland Harbor Commission, which is improving the island with dirt dug while deepening and straightening the harbor channels for shipping. The field is close to the center of the town, on the bend in the Willamette River and is two miles north of the central business district.

Boise, Idaho

By Robert Edward Blackstone

Boise business men have organized the Southern Idaho Airways, Inc., Roy Trask, local Packard dealer, one of the livest wires among the incorporators, has announced.

Commercial aviation for southern Idaho on a large scale, with Boise as a headquarters, is the goal of the corporation.

The new de luxe Waco-10 biplane, brought from the factory at Troy, Ohio, by Art Walters, owner of the Walters' Flying School, is now the property of the Southern Idaho Airways, Inc.

Harry McDougal, well known World War pilot, is flying the Waco for the S I A, doing local flights and taxi service.

An aviation school and the buying of two or three more planes are some details that are maturing, according to Mr. Trask.

Art Walters, owner Walters' Flying School, has sold his Jenny, is closing his school and returning to the middle west.

The autographed photographs of Col. Charles A. Lindbergh, that the St. Louis, Mo., Chamber of Commerce is sending out by airmail, are moving through the Pasco, Wash. post office and hence into the airmail pouches at the rate of 100 a day.

Wesley Appel, commercial flier, and Beryl Stingley, have completed the assembling of an airplane, parts for which have been bought from Kansas, California, Ohio and New York. The plane has a top wing span of 35 ft., is powered with a 150 hp. Curtiss K6 engine and sports a resplendent coat of yellow paint.

Pilot Appel's first commercial job with the new plane is a photographing flight over northern Idaho in the regions of Lewiston and Salmon City. The making of a map for government use is the object of the aerial photographic expedition.

A Varney mail plane will participate in the Spokane Air Derby, providing the factory can deliver the new plane in time, is a statement issued by Mr. Wrightson, business manager of the Varney Airmail. Chief Pilot Cuddeback will fly the new plane, a J5 Stearman, directly from San Francisco to Spokane.

The new plane is a regular job, with the exception that the fuselage is to be made narrower, in order, it is hoped to get 4 to 6 m.p.h. more speed.

Mr. Cuddeback, chief pilot for the Varney Airmail, while on a recent trip to Pasco, made a flight to Portland to get acquainted with the boys of the Pacific Air Transport, as well as to make a survey for a possible extension of the Varney airway on to Portland for passenger planes, which when established will also carry mail.

The flight from Pasco to Portland can be made in 90 min. but Mr. Cuddeback's exploration flying consumed two hours.

Another intermediate landing field for the planes on the Pasco Boise airway has been chosen by John Bonforte, superintendent of Airway Extension. The new airport is located on the Wendt Brothers' farm three miles from Baker, Ore.

The Varney mailplanes, in cases of forced landings, can use this field as well as regular commercial planes.

This acreage for the Baker field has been leased for five years. The leveling, fencing and installation of electric lights and telephone are under way.

Mr. Wrightson insists that telephones must be installed in all these fields.

"Mountain Home" with a large arrow pointing north has been painted on the roof of the Faraday Garage at Mountain Home, which is the first town 45 mi. east of Boise and on the Boise-Salt Lake airway.

Mr. Faraday is the first in this section to provide such a convenience for air traffic.

Hanford MacNider, acting secretary of war, has written to Lester F. Albert, Idaho state adjutant of the American Legion, expressing regret that a "missing engine," had prevented him from setting down at the Boise Municipal Airport in his recent flight from Salt Lake City to Spokane.

Five hundred feet of the east end of the east-west runway of the Boise Municipal Airport has been graveled and oiled and the other extension work practically finished, announces Mayor Walter F. Hansen.

The oiling will not alone reduce the dust nuisance, which is bothersome to automobiles passing on Broadway, but will facilitate the take-off of planes.

The state department of public work did the oiling, which was paid for by the city of Boise.

"Flying properly conducted is safe"—such is the slogan of the Rupert Aerial Service Company. Rupert is on the Boise-Salt Lake airway. Only recently Rupert dedicated its airport, which is 3½ mi. northeast of town. Pilots Russell Owens and Jack Brockie, with others, organized the new company. Mr. Brockie has had a plane for sometime at Rupert, using it for commercial flying.

Pilot Owens has just flown a new standard J-1 plane from Columbus, Ind. It is equipped with a 180 hp. Hispano Suiza engine. Cross-country flights and a flying school are to be inaugurated at once.

Boston, Mass.

By Daniel Rochford

Thursday, Aug. 25, saw Boston's first treatment to the "voice from the sky", advertising a popular brand of cigarettes from a Fokker tri-engine circling the down-town section at noon time. Lew Gower flew the plane while here. It is owned by the Reynolds Airways and is one of Fokker's three tri-engine planes used by the P.R.T. Air Service a year ago.

The first flying from the new Dennison Airport at Atlantic took place the week ending Aug. 27 when Franklin T. Kurt, former president of the Tech Aero Club, and now general manager for Dennison, landed his Waco from Providence, where he has been instructing at Pother's Field, at the newly filled Atlantic Airport, and made several hops. A new Kinner

is being flown to Boston from the west coast and the Dennison Airport will exhibit it or a Waco in the New England Aviation Show to Boston Sept 26 Oct 1

The Ivel Johnson Company of Boston, a large downtown hardware firm, has taken a New England agency for the American Eagle airplane

Lieut George Lusk, of Boston, on active duty at the Boston airport, made a high altitude flight with a Hisso Jenny recently, rising to 18,850 ft, according to his pocket barograph.

The Naval reservists at Squantum flew 78 hr in the week ending Aug 20 The Army, regular and reserve pilots, totaled 75 hr The National Guard flew 32 hr The Boston Airport Corporation totaled 27 hr Miscellaneous private flying aggregated 11 hr additional.

Among aviation events on the Boston calendar are Babson Aviation Conference at Wellesley Hills, Sept 13, New England Council aviation conference, Hotel Statler, Boston, Sept 30; and the air show at Mechanics Building Sept. 26 Oct 1, inclusive

UNITED STATES AIR FORCES

Training Program for Air Corps Issued

The Adjutant General's office, Washington, D C, has issued a training program for Air Corps units, 1927-1928, to all corps areas and department commanders, and commandants of general and special service schools

This deals with the training program for Air Corps units, 1927-1928, and air and ground instruction for the pursuit, bombardment, attack and observation squadrons

Station at Hampton Roads to be Enlarged

Steps are being taken to increase the enlisted men's living quarters at the Naval Air Station, Hampton Roads, Va., to accommodate approximately 300 additional men A recently appointed Air Station Development Board is engaged in outlining a development program covering a number of years. Particular attention is being paid to the general features, the locations, and the degree of priority of the proposed improvements. Development work on the east camp flying field site is estimated at 3 per cent complete.

Army Air Orders

Capt. Clifton F Wheeler Air Corps Selfridge Field, to Chief of Air Corps for duty in his office

Maj Thomas DeW Milling, Air Corps, now on duty in office of Chief of Air Corps is detailed as a member of the Aeron Board.

Vice Capt Robert Olds, Air Corps is relieved from detail as member of the Aeron Board

First Lieut Charles Chesney Wood, Air Corps Res Waynesburg Pa, to active duty Langley Field reverting to inactive status June 30 1928

First Lieut Edward Henry Holterman, Air Corps Res Woodstock Vt, to active duty Langley Field reverting to inactive status June 30 1928

Sec Lieut. Morris Adams Schrikkardt Air Corps Res Pawhuska Okla, to active duty Dunbar Field reverting to inactive status Sept 10

First Lieut. George Keere Larkin Air Corps Res, Dayton, to active duty Fairfield reverting to inactive status Sept 10

Snr Lieut David Meeing Bardon Air Corps Res, Franklin Ohio to active duty Langley Field reverting to inactive status Sept 10

Capt Charles Edmund McCullough, Air Corps Res Washington D C, to active duty Langley Field reverting to inactive status Aug 27

Snr Lieut Howard August Saxer Air Corps Res, Rochester to active duty Buffalo reverting to inactive status Sept 10

First Lieut William Edward Huffman Air Corps Res., Dayton and Snr Lieut John Frank Belgiano Air Corps Res. Dayton, to active duty Scott Field reverting to inactive status Sept 10

First Lieut Ambert Fred Diamond Air Corps Res Pittsburgh to active duty Middletown reverting to inactive status Sept 20

First Lieut William B. Clarke Air Corps Kelly Field to March Field

First Lieuts Arthur E Simmin Frank O'D Hunter and Harold H George Air Corps Res promoted to the rank of captain. These officers will remain in their present duties.

Snr Lieut. John Gasloe Berry Air Corps Res Luke Field to arrive duty Fort Shafter T H., reverting to inactive status June 30 1928

Snr Lieut. Conrad L Boyle Air Corps (Field Art.) is relieved from detail in the Air Corps and from duties at Fort Sam Houston Lieutenant Boyle is assigned to the 15th Field Art, Fort Sam Houston

Navy Air Orders

Ensign Raymond R Wolfer det VT Squad 1B Aircf Squad Battle Fleet to VF Squad 2B Aircf Squad Battle Fleet

Chief Boatswain George L Kennedy det USS Ganuet to Nav Air Sta, San Diego

Side Slips

By ROBERT R OSBORN

Mr Bill W——— seems to think that his subscription to AVIATION entitles him to the use of this column as a sort of service department, as we have just received the following letter written to him with the request that we answer it,—

Dear Mr W——— I understand that you are a flyer and have been in the air mail I am anxious to learn to fly and would like to learn in the least possible time, so am writing to ask you whether I should enter the air mail service directly or take a course somewhere else first. Very truly yours,

H——— F———, Jr

Even if Mr H——— F———, Jr's time is limited and his desire to learn to fly is so overwhelming, we would suggest that he take a short course somewhere else before entering the air mail service It would be well worth while for him to join the Army First Pursuit Group for a couple of weeks anyway

• • • •

The news that Colonel Lindbergh is endeavoring to buy the ten room farm-house, in Minnesota, which was his birthplace, came as a severe blow to the vast group of admirers who are still enthusiastically in favor of Lindbergh for our next president It wasn't so very long ago that no candidate had any chance at all of being elected president unless he had been born in a log cabin, but in later years the public has elected a few presidents who were born in two room, one-story houses A ten-room farm house would be a terrible handicap for any candidate, even one with Colonel Lindbergh's popularity.

• • • •

We can safely predict, for the residents of the eastern states, that the rains, storms, high winds and mud which they have been experiencing all summer will not be bothering them during the last half of September, as the National Air Races will be held in Spokane, Washington, this year.

• • • •

We present Mr G A P, designer of a recent very successful large airplane, as this week's outstanding example of self confidence We asked him if his ship would be able to cross the ocean safely "Why certainly," he said, "what ocean did you have in mind?"

• • • •

The newspapers announce that a prize of $100 has been offered for the best "Hymn for Airmen", the prize being offered by a church society If some one with a bit of money to spare would like to see a good free-for-all fight, he could offer a $200 prize to the first group of pilots, say a quartet, who would sing the prize-winning hymn in the presence of the rest of the pilots at any of the larger flying fields. That would be our idea of something worth seeing, and we will be glad to take care of the details if anyone cares to put up the prize.

• • • •

A communication from Mr. R. H. D, Jr, contains the clipping of an article entitled "The Recent Epoch Making Flights in a Nut Shell" and his comment "Some old time aviator—I think it was Lincoln Beachy—once said that he could fly a barn door if he had enough power, but this is the first time I ever heard of any record flights being made 'in a nut shell'." Much as we dislike descending to puns, we must call Mr. R. H. D.'s attention to the fact that there are plenty of nuts in this flying business, and even plenty of flying colonels, for that matter, so it is only logical that there should be some sort of shells for them

"Pole to Make Flight Here"—Headline. This seems to be one authenticated case of the mountain coming to Mohamet.

INDEX TO ADVERTISERS

PUBLISHER'S NEWS LETTER

The influence of aviation on other arts is beginning to arouse an appreciable interest In painting, the new perspectives of the airman are being placed on canvas, sometimes with startling effect It has even been suggested that floor paintings would be evolved as the result of the modern tendency toward realism. In sculpture, little change has been noted in the art forms but every sculptor has received added inspiration from the great personages and achievements of aeronautics Landscape gardening is certainly going to be given a new objective. Hereafter the artists who have laid out formal gardens and winding roads in parks will have to think of the view from the air to make their art take cognizance of future viewpoint But in no field will the aerial influence be as great as in architecture Heretofore, the roof of building has been hidden from view and any unsightly object could be placed there protected from the view of the public Now, however, with the airman carrying his thousands of passengers over cities, the architect will have to change his methods if he is not to be considered as lacking in all futuristic imagination.

* * * *

In an article in The Charette, the monthly publication of the Pittsburgh Architectural Club, R M Marlier, a Pittsburgh architect, who also is president of the Aero Club of Pittsburgh, picks up this theme and develops it with great perception Under the heading "Architecture and Aeronautics" he writes.

"It is well known to all that the practice of architecture has become highly complex, and this condition might well be expected since architecture, now as always, reflects the period of its creation Just as in the past it recorded migrations, conquests, and social and religious changes, so now it is influenced, in more ways than one, by the commercial age in which we live and work Our architecture cannot but reflect the characteristics of commerce, speed, competition and congestion, with the resultant building codes, zoning regulations and the miscellaneous assortment of rules of this bureau and that

* * * *

"Through the development and decline of every style of architecture, one factor alone has always remained constant, the station point of the designer, the critic, and the passer-by remains somewhere below the roof line. The mass and detail of tall buildings have been studied from the viewpoint of the man on the street We are all accustomed to the method of designing details for high structures; not in scale with the adjoining building but designed to look in scale from the street level. The occasional "bird's-eye" perspective has been intended only to show group planning, and not with the expectation of that view ever being seen Now however, the "aerial view" becomes a necessary part of every well-studied design, whether it be a group or a single building The project you are now designing will, while it stands, be viewed by thousands of aerial travelers How will it look from an altitude of two thousand feet? From five thousand feet? Obviously, it will be impossible to design detail that is in scale from all altitudes. Mass and plan must be relied upon It is surprising how much more interesting is the view of a circus tent than that of the ordinary sky-scraper, from five thousand feet.

* * * *

"Major Lester D Gardner, publisher of AVIATION, (New York), last year traveled twenty thousand miles over the airways of Europe He viewed the continent from London to Constantinople, from Gibralter to Moscow, from Stockholm to Rome Recently he stated that, to his mind, only one church in Europe looked as though the architect had considered God's view of His own home Here is a layman's thought that is worthy of our consideration: an idea born high above any drafting board! How shall we consider the aerial view of our buildings if we cannot visualize from the viewpoint of an aerial traveler. Aerial photographs, even as good as those on pages 28 and 29 of Architecture for July, 1927, fail to give the proper idea of the view from the sky. The only way this impression can be obtained, and retained, is by an occasional flight. The time is near when no architect can continue a successful general practice while ignoring the aerial age we are now entering nor can he properly anticipate its effect on his profession unless he has some knowledge of the trend of aeronautical development.

"In the not distant future all civilized countries will be covered by net-works of airways, carrying passengers, mail and express This will necessarily present practical problems for the architect, as well as the esthetic considerations above suggested. If the helicopter principle is successfully developed, then landing areas on roofs will be practical and desirable. At the present, however, the foremost aircraft engineers are working toward the perfection of huge cabin planes carrying up to one hundred passengers. The Dornier Superwal, a flying-boat, has successfully completed test flights while carrying twenty-five passengers. The first flight by man in a heavier-than-air machine was accomplished less than a quarter of a century ago The development of aeronautics in this brief space of time has been astounding. And who will say what the future holds? This new influence on our profession will have to be considered by every architect worthy of the name"

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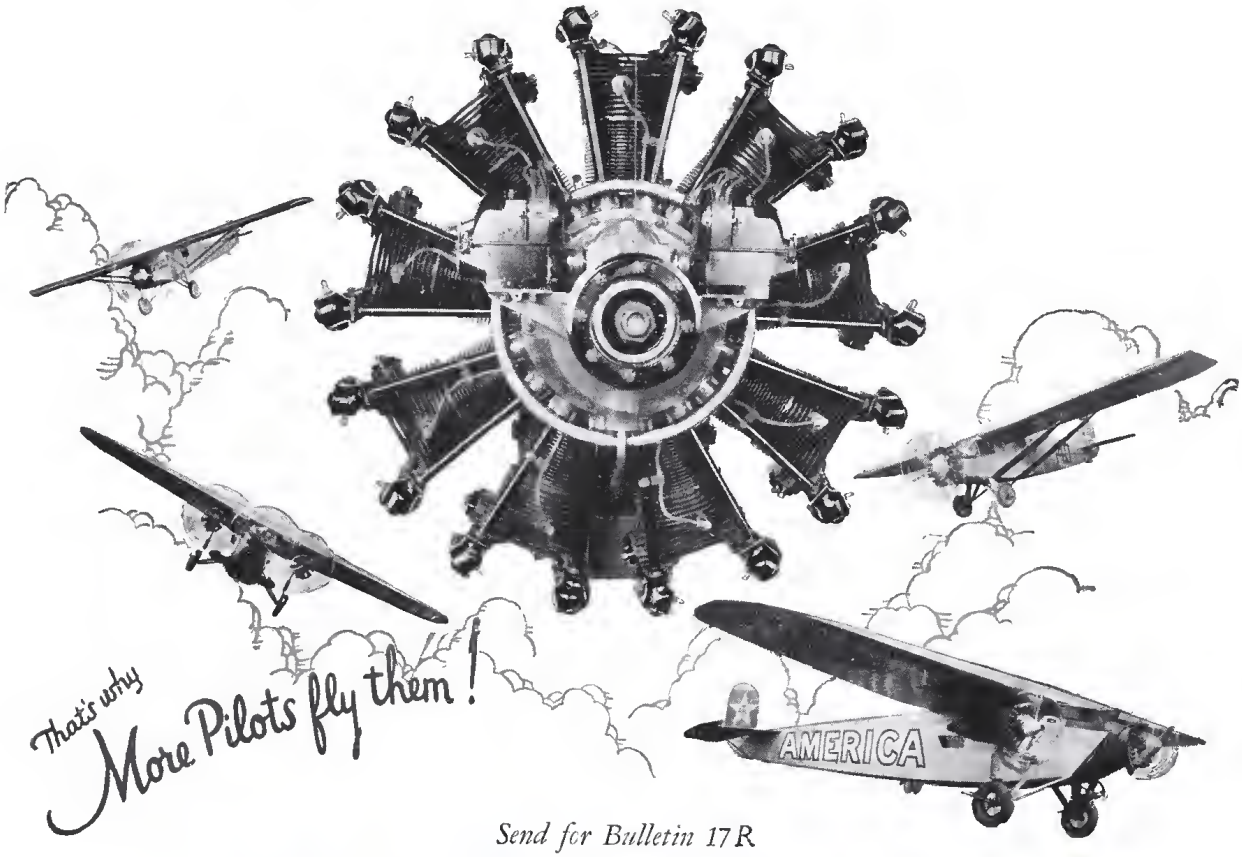

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